Missouri State Implementation Plan Revision

New Madrid County Nonattainment Area Plan for the 2010 Sulfur Dioxide Standard

Prepared for the
Missouri Air Conservation Commission

Adoption
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Acronyms and Abbreviations List

ACFM	Actual Cubic Feet per Minute
AECI	Associated Electric Cooperative, Inc.
AERMET	AERMOD Meteorological Preprocessor
AERMAP	AERMOD Terrain Processor
AERMINUTE	AERMET ASOS Wind Pre-processor
AERMOD	AMS/EPA Regulatory Model
AERR	Air Emissions Reporting Rule
AERSURFACE	AERMET Surface Characteristics Processor
AMS	American Meteorological Society
AOC	Administrative Order on Consent
ASOS	Automated Surface Observing Station
BPIP PRIME	Building Profile Input Program with Plume Rise Model Enhancements
CAA	Clean Air Act
CEMS	Continuous Emission Monitoring System
CERMS	Continuous Emission Rate Monitoring System
CFR	Code of Federal Regulations
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CSR	Code of State Regulations
DEM	Digital Elevation Model
DRR	Data Requirement Rule
EGU	Electric Generating Unit
EIS	Emission Inventory System
EPA	United States Environmental Protection Agency
FHWA	Federal Highway Administration
FTA	Federal Transit Administration
FR	Federal Register
GEP	Good Engineering Practice
g/s	Gram per Second
hr	Hour
IPM	Integrated Planning Model
K	degree Kalvin
LAER	Lowest Achievable Emissions Rate
lbs	Pounds
MACC	Missouri Air Conservation Commission
MODC	Method of Determination Code
MoEIS	Missouri Emissions Inventory System
MTSP	Mark Twain State Park
m	Meter
m/s	Meter per Second
$\mu g/m^3$	Micrograms per Cubic Meter
NAA	Nonattainment Area
NAAQS	National Ambient Air Quality Standard
NAD83	North American Datum of 1983

NEI	National Emission Inventory
NH_3	Ammonia
NO_2	Nitrogen Dioxide
NO_X	Nitrogen Oxides
NSR	New Source Review
O_3	Ozone
Pb	Lead
PM	Particulate Matter
PM_{10}	Particulate Matter less than 10 micrometers
$PM_{2.5}$	Particulate Matter less than 2.5 micrometers
ppb	parts per billion
QAPP	Quality Assurance Project Plan
RACM	Reasonably Available Control Measures
RACT	Reasonably Available Control Technology
RFP	Reasonable Further Progress
SIP	State Implementation Plan
SO_2	Sulfur Dioxide
SO_3	Sulfur Trioxide
SO_X	Sulfur Oxides
TAD	Technical Assistance Document
tpy	tons per year
ULSD	Ultra Low Sulfur Diesel
USGS	United States Geological Survey
UTM	Universal Transverse Mercator
VOC	Volatile Organic Compound

EXECUTIVE SUMMARY

The purpose of this state implementation plan (SIP) revision is to address the nonattainment area planning requirements of Clean Air Act (CAA) sections 172(c) and 191(a) for the sulfur dioxide (SO_2) nonattainment area located in New Madrid County (New Madrid County SO_2 nonattainment area). This SIP revision demonstrates attainment for the New Madrid County SO_2 nonattainment area using newly established, enforceable emission rates from an atmospheric dispersion modeling analysis.

The plan includes two new, enforceable Consent Agreements for the two major emitting facilities located in the nonattainment area, Magnitude 7 Metals LLC primary aluminum smelter (Magnitude 7) and the Associated Electric Cooperative, Inc. (AECI) – New Madrid Power Plant (New Madrid Power Plant). In addition to the new enforceable emission rates, the control strategy in this plan includes building a new 65-meter stack at Magnitude 7. The emissions from the existing stacks for the anode production, or carbon bake, process at Magnitude 7 will be re-routed to this new stack.

On March 26, 2021, the U.S. Environmental Protection Agency (EPA) finalized the designation of a portion of New Madrid County as nonattainment for the 2010 SO_2 standard.[1] EPA's basis for the designation was the 2017–2019 ambient SO_2 monitoring data, which showed violations of the 2010 SO_2 standard at two of the three monitors around Magnitude 7 and the New Madrid Power Plant. The effective date of the nonattainment designation for this portion of New Madrid County was April 30, 2021.

Per section 191(a) of the CAA, Missouri is required to submit to EPA a nonattainment area SIP revision for the 2010 SO_2 standard. The plan must demonstrate the nonattainment area will reach attainment of the 2010 SO_2 standard as expeditiously as practicable, but no later than April 30, 2026, which is five years from the effective date of the nonattainment designation.

This SIP revision also addresses the required elements of CAA section 172(c). These elements include a reasonably available control measures (RACM) and reasonably available control technology (RACT) analysis, requirements for reasonable further progress (RFP), nonattainment new source review (NSR) permitting requirements, contingency requirements, and conformity requirements. The Missouri Department of Natural Resources' Air Pollution Control Program (Air Program) prepared this plan in accordance with the CAA, the Missouri Air Conservation Law, the corresponding state and federal regulations, and EPA guidance.

[1] See *86 FR 16055*; March 26, 2021

1. Background

The CAA requires EPA to establish National Ambient Air Quality Standards (NAAQS) for SO_2 and five other criteria air pollutants impacting public health and the environment. The other criteria pollutants are ozone (O_3), particulate matter (including PM_{10} and $PM_{2.5}$), lead (Pb), nitrogen dioxide (NO_2), and carbon monoxide (CO). The CAA also requires EPA to periodically review the standards and the latest scientific information to ensure they provide adequate health and environmental protection, and to update those standards as necessary.

On June 22, 2010, the EPA established a new primary 2010 SO_2 standard of 75 parts per billion (ppb), based on the three-year average of the annual 99th percentile of one-hour daily maximum concentrations. This new SO_2 standard replaced the previous 24-hour and annual primary SO_2 standards promulgated in 1971.[2] Following a subsequent review of the primary SO_2 standard, on March 18, 2019, EPA issued a final decision to retain the 2010 SO_2 standard without revision.[3]

1.1. Boundary Designations for the 2010 SO_2 Standard

Once EPA establishes or revises a NAAQS, the CAA requires EPA to designate areas as "attainment" (meeting), "nonattainment" (not meeting), or "unclassifiable" (insufficient data). The CAA requires these designations to be final within two years after promulgation of the new or revised standard. Unlike other criteria pollutants, SO_2 is almost exclusively a point source-emitted pollutant; A monitoring network large enough to adequately cover all large sources would be prohibitively expensive and an affordable network would leave large gaps in coverage. Therefore, EPA chose a different approach to determine attainment status and promulgate initial designations for the 2010 SO_2 standard.

EPA began its designation process by reviewing existing ambient SO_2 monitoring data. In this first round, EPA only designated areas surrounding existing monitors showing violations of the standard. EPA promulgated these designations on August 5, 2013.[4] Following this first round of designations, the vast majority of the country remained undesignated.

Following the first round of designations, the Sierra Club and the Natural Resource Defense Council sued EPA for failing to promulgate initial designations for the majority of the country by the statutory deadline. In 2015, EPA executed a consent decree with these organizations. The consent decree was signed and entered by the court on March 2, 2015. The decree specified a schedule for EPA to complete SO_2 designations for the rest of the country in three additional rounds:

- Second round by July 2, 2016;
- Third round by December 31, 2017; and
- Final round by December 31, 2020.

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[2] See *36 FR 8187*; promulgated April 30, 1971
[3] See *84 FR 9866*, promulgated March 18, 2019
[4] See *78 FR 47191*; promulgated August 5, 2013

The second round focused on the largest SO_2 emitters across the country, and was based largely on atmospheric dispersion modeling for the areas surrounding these sources. The timing and process for the third and fourth rounds were defined by EPA's federal data requirements rule (DRR). The DRR requires states to characterize the air quality surrounding any source with actual SO_2 emissions greater than 2,000 tons/year. The DRR allows three options for any such source: the source could voluntarily accept an enforceable SO_2 emissions limit less than 2,000 tons/year, the source could characterize the SO_2 concentrations around the facility through the use of atmospheric dispersion modeling of actual emission levels, or the source could elect to install new monitors to measure the ambient SO_2 concentrations surrounding the facility. The rule considers sources that elected to install new ambient SO_2 monitors as round four sources, and obligates them to have the monitors operational by January 1, 2017. Monitoring data from 2017-2019 would then be used to inform the initial designations for the areas surrounding these sources.

In round three, EPA designated the areas surrounding all sources with actual SO_2 emissions greater than 2,000 tons/year that were not designated in rounds one or two, and did not elect to install new ambient SO_2 monitors pursuant to the DRR. In round three, EPA also designated any remaining area that did not include any sources with actual SO_2 emissions greater than 2,000 tons/year. For round one in Missouri, EPA designated two areas as nonattainment based on violations at existing monitors, including portions of Jefferson and Jackson counties. For round two in Missouri, EPA designated two areas as unclassifiable and one area as attainment/unclassifiable. For round three, EPA designated the remainder of the state as attainment/unclassifiable except for Iron and New Madrid counties, which remained undesignated. These two counties included three sources with actual SO_2 emissions greater than 2,000 tons/year. The sources are Magnitude 7, New Madrid Power Plant, and Doe Run Buick. Each elected to install new ambient SO_2 monitors to characterize the SO_2 concentrations around their facilities.

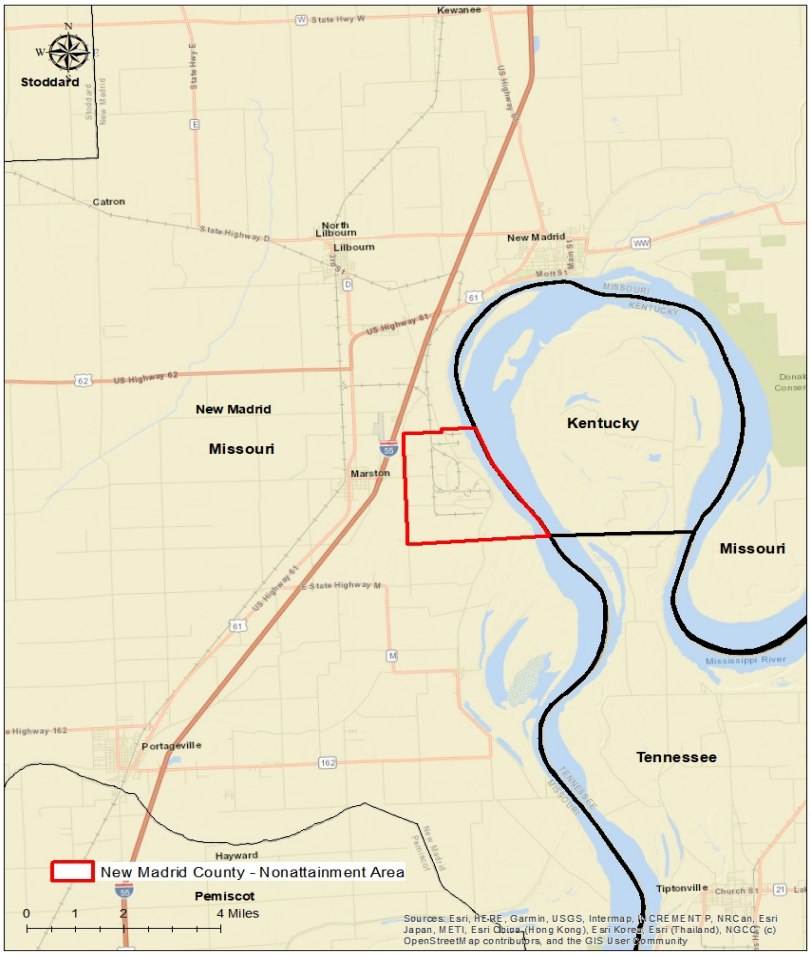
On January 1, 2017, Magnitude 7 began operating three ambient SO_2 monitoring sites around the Magnitude 7 facility and the neighboring New Madrid Power Plant. Doe Run Buick also began operating three new ambient SO_2 monitoring sites around their facility in Iron County. On March 26, 2021, EPA finalized the designation of a portion of New Madrid County as nonattainment for the 2010 SO_2 standard.[5] EPA designated the remainder of New Madrid County and all of Iron County as attainment/unclassifiable in this same action. EPA's basis for the nonattainment designation in a portion of New Madrid County was the 2017–2019 ambient SO_2 monitoring data, which showed violations of the 2010 SO_2 standard at two of the three monitors around Magnitude 7. The effective date of the nonattainment designation for this portion of New Madrid County was April 30, 2021.

Figure 1 depicts a map of the designated nonattainment area with the location of the three SO_2 monitors used to designate the area. A description of the nonattainment area boundaries is codified in 40 CFR 81.326. The description is as follows –

[5] See *86 FR 16055*; promulgated March 26, 2021

Area bounded by: East: Missouri/Kentucky and Missouri/Tennessee State lines. North: County Highway 406 East to Levee Road, following Levee Road North to County Highway 406, then extending directly East to the Missouri/Kentucky State line. West: County Highway 403 South: County Highway 408 East to the intersection with County Highway 431, then extending directly East to the Missouri/Tennessee State line

Figure 1. New Madrid County (portion) Nonattainment Area Boundary for the 2010 SO_2 Standard



1.2. CAA Nonattainment Area SIP Requirements

Per section 191(a) of the CAA, Missouri is required to submit to EPA a SIP revision for the nonattainment area within 18 months of the nonattainment designation. The SIP revision must demonstrate the nonattainment area will reach attainment of the 2010 SO_2 standard as expeditiously as practicable, but no later than five years from the date of the nonattainment designation, or April 30, 2026.

Section 110 of the CAA specifies general SIP requirements and Part D of the CAA includes requirements for nonattainment areas. The purpose of this current SIP revision is to address the CAA Part D requirements for the New Madrid County SO_2 nonattainment area. The CAA at Section 172 delineates the general Part D nonattainment SIP provisions. Section 172(c) specifies

SIPs submitted to satisfy Part D requirements shall, among other things, provide for attainment of the applicable standard via federally enforceable measures and limitations. The SIP must also address requirements related to RACM, RACT, RFP, emission inventory, nonattainment NSR permitting provisions, contingency planning requirements, conformity requirements, and it must satisfy the applicable provisions of section 110(a)(2) of the CAA related to the general implementation of a new or revised standard. The subsections below provide brief descriptions of each of the CAA requirements addressed in this SIP revision for the New Madrid County nonattainment area.

1.2.1. CAA Sections 172(c)(1) and 172(c)(2) – RACM, RACT, Attainment, and RFP

CAA Section 172(c)(1) requires nonattainment area plans to provide for all RACM and RACT requirements as expeditiously as practicable and to provide for attainment of the relevant NAAQS. CAA Section 172(c)(2) requires nonattainment area plans to provide for RFP. Chapters 4 and 5 of this document describe the atmospheric dispersion modeling analysis performed to demonstrate attainment of the 2010 SO_2 standard. Chapter 7 of this document describes how the Air Program is satisfying the requirements for RACM, RACT, and RFP for the New Madrid County SO_2 nonattainment area.

1.2.2. CAA Section 172(c)(3) – Baseline Emissions Inventory

CAA Section 172(c)(3) requires nonattainment area plans to include a comprehensive, accurate, current inventory of actual emissions from all sources of the relevant pollutant in such area, including such periodic revisions as EPA deems necessary to assure that all nonattainment area requirements are met. Chapter 3 of this document provides the baseline SO_2 emissions inventory for the New Madrid County SO_2 nonattainment area, and describes how the Air Program is satisfying the requirement for periodic emission inventory revisions.

1.2.3. CAA Sections 172(c)(4) and 172(c)(5) – Emissions and Permitting for New and Modified Major Stationary Sources

CAA Section 172(c)(4) requires nonattainment area plans to identify and quantify the emissions allowed from the construction and operation of major new or modified stationary sources in the nonattainment area. CAA Section 172(c)(5) requires nonattainment area plans to require permits in accordance with the provisions in CAA Section 173 for the construction and operation of new or modified major stationary sources in the nonattainment area. Chapter 8 of this document addresses these requirements related to emissions and permitting for new and modified major stationary sources.

1.2.4. CAA Section 172(c)(6) – Other Measures to Provide for Attainment

CAA Section 172(c)(6) requires nonattainment area plans to include emission limitations and other such control measures, means, or techniques to provide for attainment of the relevant NAAQS by the applicable attainment date. Chapter 6 of this document describes the control strategy included in this SIP revision that will provide for attainment of the 2010 SO_2 standard as demonstrated in the dispersion modeling attainment demonstration detailed in Chapters 4 and 5 of this document.

1.2.5. CAA Section 172(c)(7) – CAA Section 110 Infrastructure Requirements

CAA Section 172(c)(7) requires that nonattainment area plans must also meet the applicable provisions of CAA Section 110(a)(2), which are commonly referred to as infrastructure SIP requirements that include the general SIP requirements for all areas following the promulgation of any new or revised NAAQS. On July 1, 2013, the Air Program submitted to EPA the Missouri SIP revision titled: *Section 110 Infrastructure Requirements for the 2010 Sulfur Dioxide National Ambient Air Quality Standard*. EPA approved all elements included in this infrastructure SIP through two separate actions on March 22, 2018 [6] and on September 24, 2018.[7]

Further, all SIP revisions must provide reasonable public notice and public hearings as stipulated in CAA Section 110(a). Chapter 9 of this document describes the steps the Air Program took to satisfy the public participation requirements for this SIP revision.

1.2.6. CAA Section 172(c)(8) – Equivalent Techniques

CAA Section 172(c)(8) allows for states to submit an application for EPA to allow equivalent techniques to meet the modeling, emission inventory, and planning requirements for nonattainment areas. EPA may not allow the use of equivalent techniques pursuant to CAA 172(c)(8) if such techniques are less effective than the techniques prescribed by EPA. The Air Program has not requested the use of equivalent techniques in this SIP revision.

1.2.7. CAA Section 172(c)(9) – Contingency Measures

CAA Section 172(c)(9) requires that nonattainment area plans include specific measures to be undertaken if the area fails to make reasonable further progress, or to attain the standard by the attainment deadline. The plan must provide that these measures will take effect in such case without further action by the state or EPA. Chapter 8 of this document provides the contingency plan and necessary contingency measures to satisfy this CAA requirement.

1.3. Current Action

This plan satisfies all the CAA nonattainment area SIP requirements for the New Madrid County SO_2 nonattainment area. The plan also follows all relevant portions of EPA's Guidance for SO_2 Nonattainment Area SIPs.[8] The modeled attainment demonstration in Chapter 5 of this plan successfully demonstrates attainment of the 2010 SO_2 standard throughout the full nonattainment area based upon implementation of required control measures and emission limits at Magnitude 7 and the neighboring New Madrid Power Plant.

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[6] See *83 FR 12496*; March 22, 2018

[7] See *83 FR 48242*, September 24, 2018

[8] Stephen Page memo, Guidance for 1-Hour SO_2 Nonattainment Area SIP Submissions, April 23, 2014

2. Ambient Air Quality Monitoring

The CAA requires ambient air monitoring networks to be established to protect and assess air quality. One of the main purposes of collecting air samples is to assess compliance with, and progress towards, meeting ambient air quality standards. The Air Program summarizes its statewide monitoring network, and any changes to it, in its annual air quality monitoring network plan in accordance with 40 CFR 58 Part B. EPA approved Missouri's 2021 air quality monitoring network plan in a letter dated October 29, 2021. The monitoring network plan is available at: https://dnr.mo.gov/air/what-were-doing/air-monitoring.

2.1. Air Quality Monitoring Network

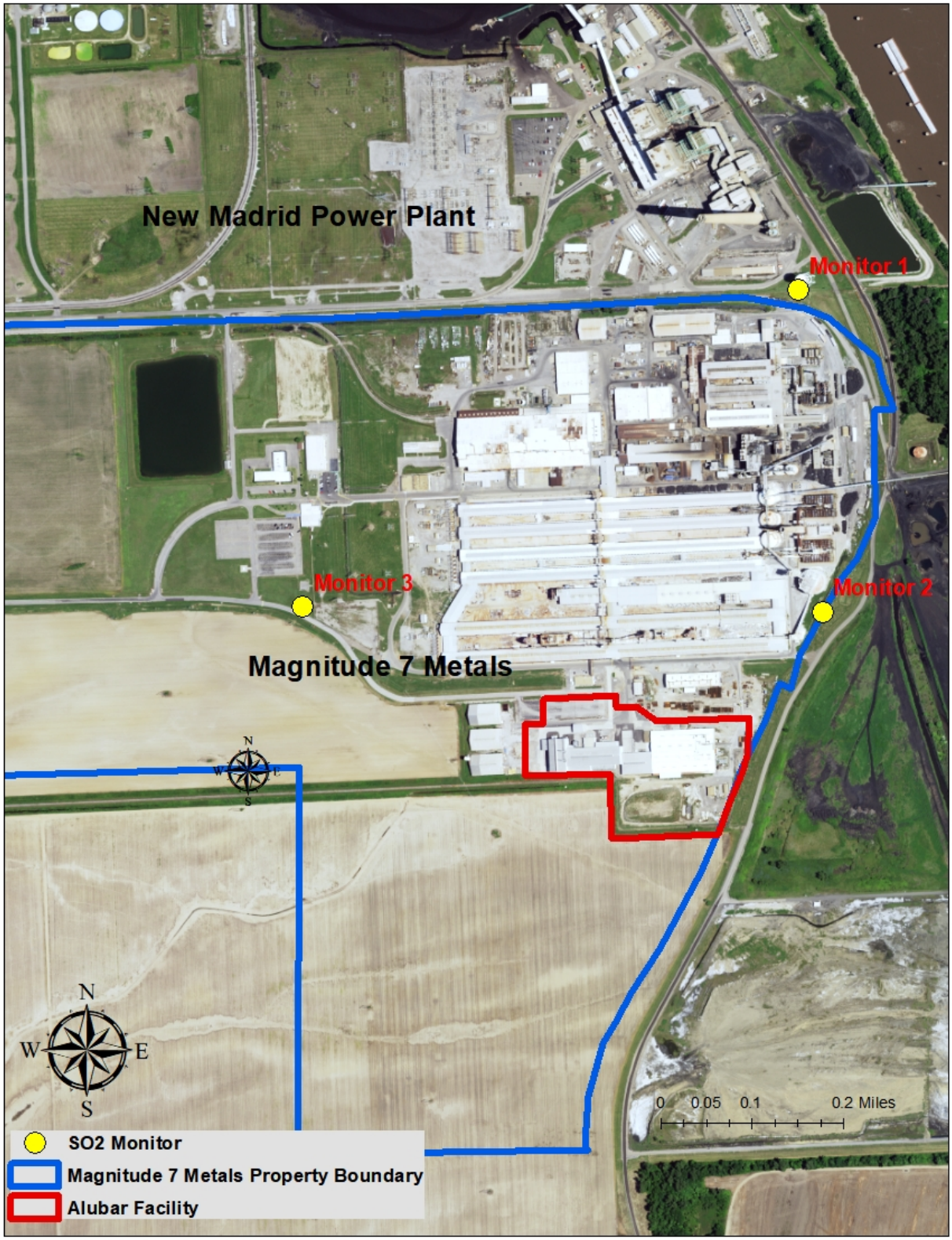
The Ambient Air Quality Monitoring Network for Missouri includes State and Local Air Monitoring Stations (SLAMS), Special Purpose Monitors (SPM) and a National Core (NCore) monitoring site consistent with requirements in federal regulation in 40 CFR 58. Section 40 CFR 58.10 requires states to submit an annual monitoring network plan including any proposed network changes to EPA. The plan must include a statement of whether the operation of each monitor meets the requirements of appendices A, B, C, D and E of 40 CFR 58, where applicable. All of the monitors in the Missouri air monitoring network, including those operated by the State and those operated by industries (facility-specific) under state review, meet the applicable requirements of 40 CFR 58. Any changes to the SLAMS require approval by the EPA Regional Administrator.

Prior to the June 22, 2010 promulgation of the 2010 SO_2 standard, all of Missouri maintained compliance with the previous primary and secondary SO_2 standards based on the statewide SO_2 monitoring network operating at the time. In fact, monitored values of the previous primary SO_2 standards (both 3-hour and 24-hour averaging periods) were historically recorded well below the standards. This enabled the Air Program to discontinue operation (prior to 2007) of several SO_2 monitoring sites where violations were not an issue. Further, in 2010, five additional SO_2 monitoring sites that were not recording violations of the 2010 SO_2 standard were temporarily discontinued primarily due to state budgetary concerns. Of these five SO_2 monitoring sites, the Mark Twain State Park (MTSP) site resumed SO_2 monitoring on July 1, 2012. The MTSP site is generally considered a good benchmark for background concentrations due to its remote location in the state.

Following the promulgation of the 2010 SO_2 standard, 13 facility-specific monitors have been installed to measure the maximum SO_2 concentrations surrounding five major SO_2 emission sources. Among these sources are Magnitude 7 and the New Madrid Power Plant. In January of 2017, Magnitude 7 began operating three ambient SO_2 monitors around these two neighboring facilities. As required by the EPA's DRR for the 2010 SO_2 standard, the three monitors around Magnitude 7 and the New Madrid Power Plant are located near the Magnitude 7 fence-line. Monitor 1, also called the AECI Water Tower Monitor, sits at the northeastern corner of the facility fence-line. Monitor 2, also called the East Graveyard Monitor, sits along the south-eastern fence-line almost directly south of the AECI Water Tower Monitor. Monitor 3, also called the West Entrance Monitor, sits along the western fence-line of the facility. Figure 2 provides the locations of these three monitors. The Air Program chose these sites based on

frequent and high modeled concentrations, thus allowing the ability to accurately measure the peak SO_2 concentrations resulting from emissions from these two facilities.

Figure 2. Ambient SO_2 Monitors Near Magnitude 7 and New Madrid Power Plant



2.2. Monitoring Data

Table 1 shows 2017–2021 99th percentile one-hour SO_2 monitoring concentration data in parts per billion (ppb) from these three monitors. The table also shows the 2017–2019, 2018–2020, and 2019–2021 monitor design values. The design value is based on the 3-year average of the 99th percentile of the daily maximum one-hour average concentrations at each monitor. It is noted that in 2017, the highest 99th percentile one-hour value recorded at any of the three monitors was 13 ppb. During this year, the New Madrid Power Plant was operating normally; however, the Magnitude 7 facility was idled. The sites began measuring exceedances of the standard in the summer of 2018, shortly after the Magnitude 7 facility resumed operations.

Table 1. 2017–2021 99th Percentile one-hour SO_2 Monitoring Concentration Data from Monitors Near Magnitude 7 and New Madrid Power Plant

Site	2017 (ppb)	2018 (ppb)	2019 (ppb)	2020 (ppb)	2021 (ppb)	2017–2019 Design Value (ppb)	2018–2020 Design Value (ppb)	2019–2021 Design Value (ppb)
AECI Water Tower (monitor 1)	13	236	356	367	405	202	320	376
East Graveyard (monitor 2)	5	370	428	285	292	268	361	335
West Entrance (monitor 3)	7	43	91	70	115	47	68	92

3. Emissions Inventories

Clean Air Act Section 172(c)(3) requires nonattainment plans to include a comprehensive, accurate, current inventory of actual emissions from all sources of the relevant pollutant or pollutants in the nonattainment area. The plan must include such periodic revisions as the Administrator may determine necessary to assure the requirements for the nonattainment area are met. EPA's Guidance for SO_2 Nonattainment Area SIPs states that air agencies should also submit a projected attainment year inventory that includes estimated emissions for all emission sources of SO_2 which are determined to have an impact on the affected nonattainment area for the year in which the area is expected to attain the standard. Section 3.1 of this document provides the base year emission inventory for the New Madrid County SO_2 nonattainment area, and Section 3.2 provides the attainment year emissions inventory. Section 3.3. provides a discussion of the requirement for periodic updates to the emission inventory.

3.1. Base Year Emission Inventory

The Air Program creates air emission inventories for criteria pollutants and hazardous air pollutants to meet federal reporting requirements consistent with EPA's Air Emissions Reporting Rule (AERR) published December 17, 2008, and to provide data that supports the functions of the Air Program, including SIP inventory needs. The SO_2 emissions inventory includes anthropogenic emissions from point source facilities like industrial plants, mobile source emissions from diesel powered vehicles, and nonpoint sources of emissions where many small sources are estimated at the county level (household fuel combustion emissions are combined). Point source emissions are reported directly by permitted sources in Missouri, while nonpoint, onroad, and nonroad source emissions are estimated using EPA guidelines and state-specific data.

For the New Madrid County SO_2 nonattainment area, the Air Program selected 2017 as the base year. This corresponds to the most recent year of the triennial National Emission Inventory (NEI) developed by states and EPA for the entire country. However, as mentioned in Chapter 2, one of the large point sources in the nonattainment area (Magnitude 7) did not operate for the entirety of 2017 or the first half of 2018. Therefore, the Air Program used the emissions from this facility from 2019 in the development of the base year emissions inventory for this plan.

Point sources of SO_2 emissions in New Madrid County include two large emission sources, Magnitude 7 and New Madrid Power Plant, in addition to several other minor sources. Nonpoint sources of SO_2 include the emitting sources that are not inventoried by collecting site specific data. The Air Program estimates nonpoint emissions based on activity surrogates at the county level. For New Madrid County, including portions outside the nonattainment area, the most recently available nonpoint inventory is from the 2017 National Emission Inventory (NEI). The same is true for onroad and nonroad mobile sources.

Table 2 shows that point sources dominate the SO_2 emissions making up 99.92 percent of the total emissions from the county. The nonpoint sources of SO_2 emissions are 0.05 percent of the total county SO_2 emissions. The onroad and nonroad sources of SO_2 emissions are from vehicles and equipment that use fuel containing sulfur. In New Madrid County, onroad and nonroad sources comprise 0.02 percent and 0.01 percent of countywide SO_2 emissions, respectively.

Table 2 provides the county-level SO_2 emissions and percentages for each of these source categories as reported in the 2017 NEI, and the 2019 actual emissions from Magnitude 7.

Table 2. New Madrid County Base Year SO_2 Emissions Inventory Summary

Emission Category	2017 SO_2 Emissions (tpy)	Percent of Total Emissions
Point Source Total*	13,548.73	78.46%
Magnitude 7 (2019 Emissions)	3,706.01	21.46%
Point Source Total with Magnitude 7 2019 Emissions	17,254.74	99.92%
Non-point Total	9.25	0.05%
Nonroad Total	1.10	0.01%
Onroad Total	4.18	0.02%
Total	17,269.27	

*Does not include emissions from Magnitude 7 since it did not operate in 2017

SO_2 emissions in the New Madrid County SO_2 nonattainment area are driven by two large point sources, Magnitude 7 and New Madrid Power Plant. These two sources have Title V operating permits and are considered major stationary sources of SO_2. The facilities are also subject to the Missouri Emission Inventory Reporting Rule, 10 CSR 10-6.110. The rule requires sources to characterize their total annual actual facility emissions by describing the equipment generating the emissions, emission estimation methods, emission control devices, and release parameters. At a point source facility, emissions are generated by many types of equipment and processes, including, but not limited to, electric generating units (EGU), boilers, other fossil fuel combustion equipment, mineral processing, and other industrial operations.

A facility chooses to submit point source emission data via online submission or paper forms to the Air Program. Over 90 percent of facilities choose to submit data online, though all data, whether received electronically or hardcopy, is entered into the Air Program's emissions database called the Missouri Emissions Inventory System (MoEIS). MoEIS performs initial quality assurance steps by ensuring minimum data fields are included and data is within acceptable ranges. The Air Program then performs additional quality assurance activities, including, but not limited to, year-to-year variance, industry-type comparisons, and external data source verification. Where appropriate, the Air Program corrects the emissions data with the acknowledgment of the facility representative.

Additional details regarding the 2017 base year emission inventory are included in Appendix A. For all sources other than Magnitude 7, the Air Program obtained the baseline emissions inventory from the 2017 NEI database. The Air Program developed a comprehensive statewide emissions inventory for 2017, as described above and as required by the EPA's AERR rule. The Air Program submitted the emissions inventory to the NEI through the EPA's Emission Inventory System (EIS). The emissions inventory includes point, nonpoint, onroad mobile, and nonroad mobile source emissions. The supporting documentation and sources of information used to develop the 2017 NEI are in the associated technical support document and appendices.

3.1.1. Major Sources in the Nonattainment Area

There are only two major sources in the nonattainment area: Magnitude 7 and New Madrid Power Plant. Parts 3.1.1.1. and 3.1.1.2. below provide a description of these two sources and their contributions to SO_2 concentrations in the nonattainment area.

3.1.1.1. Magnitude 7 Metals

Magnitude 7 operates a primary aluminum reduction plant in New Madrid County. The company is an existing primary aluminum reduction installation. Magnitude 7 dissolves raw aluminum-containing salts and oxides at high temperature and then uses electrolysis to isolate the aluminum metal. Electrolysis produces metallic aluminum as well as oxide gasses such as carbon dioxide (CO_2), CO, SO_2, nitrogen oxides (NO_x) and some fluoride compounds. Electrolysis requires carbon block anodes, which are consumed as the aluminum metal separates from the solution. These are produced on-site by heating a mixture of petroleum coke and pitch to remove impurities leaving mostly carbon behind.

Magnitude 7's SO_2 emissions come from two types of sources. The first type are the on-site Carbon Bake furnaces, which produce the carbon block anodes. As the carbon block anodes are baked with the goal of removing volatiles, some sulfur in the raw coke and pitch is also "baked out" of the carbon block as SO_2. The second emission source type is from the electrolysis Pot Lines. Magnitude 7 has three Pot Lines, but only Pot Lines 1 and 2 operated during the past four years. Sulfur still present in the carbon blocks oxidizes in the Pot Lines to form SO_2. Pot Lines are under negative pressure and route emissions through fluoride scrubbers and then into a common stack. Although the Pot Lines are under negative pressure, both lines contain roof vents spanning the building, and some emissions that are not captured are released through these roof vents.

Although the process in the Pot Lines results in significantly more SO_2 emissions than the Carbon Bake furnaces, air dispersion modeling conducted during the area designation process indicated that due to the relatively low emission release points of the Carbon Bake furnaces, they are the primary concern for causing elevated ground level SO_2 concentrations in the area. There are three Carbon Bakes furnaces, only two of which have operated in the last four years. Carbon Bake furnaces 1 and 2 are the furnaces that bake the anodes for use in Pot Lines 1 and 2. The two furnaces themselves contain extremely similar processes and both are under negative pressure. The exhaust streams from these two furnaces are first merged, and then divided with half of the emissions routing to a fluoride scrubber and then onto a single stack, and the other half routing through fluoride scrubbers and a battery of 64 stacks. The 64-stack battery is divided into four separate scrubbers each with 16 individual stacks with relatively low release heights compared to the surrounding structures. Based on the air dispersion modeling conducted for the area, and additional pollution and wind rose analysis, the Air Program determined that this 64-stack battery contributed more than 75 percent of the modeled SO_2 concentrations in the nonattainment area. Both the Air Program and Magnitude 7 have agreed that rerouting the emissions from the operating carbon bake furnaces to a new single stack at good engineering practice (GEP) stack height is necessary to bring the SO_2 concentrations in the area into compliance with the 2010 SO_2 standard.

3.1.1.2. New Madrid Power Plant

New Madrid Power Plant operates two coal-fired steam boilers to generate electric power. They are the main sources of SO_2 emissions for this facility. The emissions from these boilers are routed through a dual stack that uses continuous emissions monitoring systems (CEMS) to measure actual hourly SO_2 emissions from each of the two boilers.

3.2. Attainment Year Emissions Inventory

EPA's Guidance for SO_2 Nonattainment Area SIPs recommends that air agencies include a projection of future emissions in the nonattainment area. The guidance also stipulates that air agencies should follow 40 CFR 51 Appendix W when conducting modeling in an attainment demonstration for an SO_2 nonattainment area. Because Appendix W requires the use of potential emissions for significant point sources in the nonattainment area, and the two point sources that account for over 99 percent of all SO_2 emissions in the entire county are both included in the nonattainment area, an accurate future year emission projection may be unnecessary to include in this plan. However, in keeping with the EPA guidance, the Air Program developed this projection.

The attainment deadline for the nonattainment area is April 30, 2026. Therefore, the Air Program selected 2026 as the future year in this plan. Additional details regarding the development of the 2026 attainment year emissions inventory for this plan are provided in Appendix B. For the purpose of this plan, and due to the insignificant emission levels of SO_2 for all source categories other than point sources, the Air Program presents the emissions for nonpoint, onroad, and nonroad sources at the county level. The Air Program obtained the 2026 emissions inventory from EPA' 2016v2 modeling platform.[9] The emissions in the inventory reflect the expected actual emissions in the 2026 attainment year. Table 3 shows the New Madrid County 2026 SO_2 emissions summary. The table shows a projected SO_2 emissions increase of 4,176 tons per year between the 2017 base year inventory and 2026. Nearly all of this projected increase stems from the Air Program's conservative use of the emissions from the New Madrid Power Plant as estimated by EPA's Integrated Planning Model (IPM) projection tool in the 2016v2 modeling platform for 2026.

Table 3. New Madrid County (Entire County) 2026 SO_2 Emissions Summary

Emission Category	**2026 SO_2 Emissions (tpy)**	**Percent of Total Emissions**	**Difference between 2026 and 2017***
Point Source Total	21,440.75	99.98%	4,186.01
Nonpoint Total	2.30	0.01%	- 6.95
Nonroad Total	0.52	0.00%	- 0.58
Onroad Total	1.73	0.01%	- 2.45
Total	21,445.30		4,176.03

* Negative value indicates emission decreases from 2017 to 2026

[9] https://www.epa.gov/air-emissions-modeling/2016v2-platform

Despite the projected increase in SO_2 emissions, stemming from EPA estimates using the IPM projection tool, the modeled attainment demonstration included in this plan still results in compliance. The Air Program based the modeled attainment demonstration in this plan on potential emissions from both New Madrid Power Plant and Magnitude 7. As such, the modeled attainment demonstration assumes even higher emission levels from these two sources (34,000 tons per year). Even with these conservative emission projections for these two point sources, the modeling analysis still demonstrates compliance with the 2010 SO_2 standard throughout the nonattainment area.

3.3. Emission Inventory Periodic Update

Clean Air Act Section 172(c)(3) requires nonattainment plans to include a comprehensive, accurate, current inventory of actual emissions from all sources of the relevant pollutant or pollutants in such area, including such periodic revisions as the Administrator may determine necessary to assure that the requirements for the nonattainment area are met. The Air Program complies with this through 40 CFR Part 51, Subpart A, AERR, which requires the Air Program to develop and submit periodic emissions inventories to EPA every three years. Per the AERR, the Air Program submitted to EPA's National Emissions Inventory (NEI) through EPA's EIS the 2011, 2014, and 2017 periodic emissions inventories as a comprehensive and detailed estimate of statewide air emissions.

The reported pollutants include NO_x, volatile organic compounds (VOC), CO, SO_2, ammonia (NH_3), $PM_{2.5}$, and PM_{10}. The inventory identifies the type of emissions sources, amount of each pollutant emitted, and the types of processes and control devices employed at each facility or source category. The AERR emissions inventories are derived from estimates developed for four general categories of anthropogenic emissions sources: point, area or nonpoint, nonroad mobile, and onroad mobile.

4. Air Dispersion Modeling

The preamble of the final rule that established the 2010 SO_2 standard requires dispersion modeling to demonstrate compliance with the 2010 SO_2 standard in nonattainment areas. Guidance for SO_2 Nonattainment Area SIPs recommends the use of the AERMOD modeling system, EPA's preferred near-field dispersion model, for the SO_2 analysis.

As currently formulated, EPA's guideline models yield concentration impacts in units of micrograms per cubic meter ($\mu g/m^3$) and do not yield results in the dimensionless levels of parts per volume of the NAAQS for gaseous air pollutants (i.e., O_3, NO_2, SO_2, and CO). In all modeling analyses and results contained as part of this attainment demonstration, modeled concentrations are taken at ambient conditions of 25° C and 760 mm Hg and were converted as: 1 ppb SO_2 = 2.623 $\mu g/m^3$.[10] Based on this conversion, the 75 ppb one-hour standard is equal to 196.7 $\mu g/m^3$.

The AERMOD system was developed as a collaboration between the American Meteorological Society (AMS) and the EPA. AERMOD is a steady-state plume model that employs Gaussian and bi-Gaussian probability density functions to characterize the structure of the planetary boundary layer. AERMOD can predict the concentration distribution of pollutants from surface and elevated releases located within simple or complex terrain. The model allows for the input of multiple sources, terrain elevations, structure effects, various grid receptors, wet and dry depletion calculations, urban or rural terrain, and averaging periods ranging from one hour to one year.

The Air Program used the AERMOD modeling system to determine compliance with the 2010 SO_2 standard in this plan. AERMOD is the preferred model for determining pollutant impacts from industrial source complexes where emissions are released from a variety of source types. The Air Program used the most recent version (version 21112) of the AERMOD dispersion model, as well as the preprocessors, to perform the air quality analyses necessary to ultimately demonstrate attainment in the nonattainment area. The Air Program also used AERMOD to determine a specific control strategy coupled with emission scenarios that resulted in compliance with the 2010 SO_2 standard. The Air Program ran AERMOD and its corresponding preprocessors in a DOS Windows interface. The AERMOD preprocessors include:

- AERMAP: the terrain processor for AERMOD (version 18081)
- AERMET: the meteorological data processor for AERMOD (version 21112)
- BPIP PRIME: the building input processor (version 04274)
- AERMINUTE: a one-minute ASOS winds pre-processor to AERMET (version 15272)
- AERSURFACE: the surface characteristics processor for AERMET (version 20060)

The Air Program set the regulatory default options within the modeling system through the use of the MODELOPT keyword contained within the control pathway of the air quality model. The Air Program included terrain elevation data, routine processing of averages when missing data or

[10] http://www.epa.gov/region1/communities/pdf/CapeWind/CapeWindModelingReview.pdf

calm meteorological data occurs and stack-tip downwash calculations. The Air Program also made a site determination of "urban" or "rural" to account for differences in boundary layer concentrations and whether to employ the 4-hour half-life option for urban SO_2 sources.

For any dispersion modeling exercise, identifying whether a modeling area is urban or rural is important to determine the boundary layer characteristics that affect the model's prediction of downwind concentrations. For SO_2 modeling, the urban/rural determination is important because AERMOD invokes a 4-hour half-life for urban SO_2 sources. Appendix A – Subsection 6.6 of the SIP guidance details the procedures used to determine if a source area is urban or rural based on land use or population density.

For performing the modeling of the analysis area, the Air Program determined, based on previous modeling experience, that it was most appropriate to run the model in rural mode. The Guideline on Air Quality Models, Appendix W section 7.2.1.1(b) instructs users to define the urban or rural classification of the area considering land use and population density. The land use procedure in Appendix W section 7.2.1.1(b)(i) classifies urban areas based on industrial, commercial, and residential land use over 50% within a 3 km radius of the source. The population density (section 7.2.1.1(b)(ii)) threshold of the 3 km radius surrounding each facility is compared to the urban threshold of 750 people per square kilometer. The Air Program used both the land use and population density guidelines in Appendix W to assess the characteristics of the area and determined it to be rural.

4.1. Modeling Domain

The purpose of the modeling domain is to ensure emissions from all contributing SO_2 sources are accounted for in the model. The modeling domain in this plan encompasses the entire New Madrid County nonattainment area as designated by EPA and described in section 1.1. of this document. The center of the domain is around the two major SO_2 sources in the area, Magnitude 7 and New Madrid Power Plant. A modeling domain typically extends 20 kilometers from the center of the nonattainment area to make sure all major emission sources are included in the modeling demonstration. However, there is no reason to expand the modeling domain further since there are no additional major SO_2 sources within 20 kilometers of the nonattainment area. The Air Program explicitly modeled the potential emissions from these two facilities (and the Rod Mills previously owned by Magnitude 7) and accounted for the effects of other minor sources, and sources located outside the nonattainment area, through the use of an established background concentration.

4.1.1. Modeling Sources

In this refined air quality modeling analysis, the Air Program included SO_2 sources within the modeling domain that were determined to have an impact within the nonattainment area boundaries. The Air Program developed ambient air quality inputs based on the criteria outlined in Appendix W. The Air Program determined that only two major SO_2 sources are present in the nonattainment area: Magnitude 7 and New Madrid Power Plant. In December 2021, Alubar purchased Rod Mills 1, 2 and 3 from Magnitude 7. Alubar requested that Magnitude 7 and the Rod Mill be considered separate facilities. Table 4 shows the rest of SO_2 sources along with the

Rod Mill, within or near the nonattainment area. These sources have combined SO_2 potential emissions less than 1.68 tpy. Due to the small amount of SO_2 emissions from these sources, the Air Program accounted for them in the background concentration, except Alubar (Rod Mill), which the Air Program also explicitly modeled due to its proximity to Magnitude 7 and the fact that it was recently part of the Magnitude 7 property.
Figure 3 shows the nonattainment area along with Magnitude 7, New Madrid Power Plant, and the SO_2 sources in Table 4.

Table 4. SO_2 Sources in and around New Madrid Nonattainment Area

Source Name	Potential Emission (tpy)
SRG Global Coatings, Inc.	0.108
Heartland Asphalt Materials New Madrid	0.065
Consolidated Grain and Barge Co. - Linda	0.242
Nutrien, Inc.	0.041
Southeast Missouri Crematory	0.716
ADM Grain Company	0.188
Riceland Food Inc.	0.070
Alubar (Rod Mill)	0.250

Figure 3. SO_2 Sources in and around New Madrid Nonattainment Area

4.1.2. Receptor Grid

The Air Program used a discrete Cartesian grid with 100 meter receptor spacing that encompasses the entire New Madrid County SO_2 nonattainment area. The receptors cover the area bounded by: East: Missouri/Kentucky and Missouri/Tennessee State lines. North: County Highway 406 East to Levee Road, following Levee Road North to County Highway 406, then extending directly East to the Missouri/Kentucky State line. West: County Highway 403 South: County Highway 408 East to the intersection with County Highway 431, then extending directly East to the Missouri/Tennessee State line. The Air Program also used a discrete Cartesian grid with 50 meters receptor spacing around Magnitude 7 property boundary.

The Air Program modeled two receptor grid scenarios. The first receptor grid scenario, depicted in Figure 4, includes all receptors inside the nonattainment area except those inside the Magnitude 7 property boundary. This scenario also includes receptors located outside the nonattainment area. The attainment strategy in this plan is designed to achieve attainment in the most expeditious manner as practicable. However, the strategy will disperse emissions from the existing carbon bake process at Magnitude 7 through a taller stack to prevent the build-up of high pollutant concentrations at ground/exposure-level. Further, although the proposed plan includes new limits that are more stringent than the existing emission limits at both facilities, the new limits are not designed to drive new emission reductions, because the limits needed to demonstrate attainment following the construction of the new stack are higher than current actual emission levels. For these reasons, it was necessary to ensure the new stack and the newly established emission limits would not result in pollutant concentrations exceeding the standard for communities located near but outside the nonattainment area. Therefore, the Air Program expanded the receptor grid in this first scenario by adding 200 meter receptor spacing outside the nonattainment area to make sure there are no violations beyond it. The Air Program continued to add receptors until the receptors at the edges of the expanded modeling receptor grid showed concentrations that were no longer increasing. Based on this, the new modeling receptor grid is now 12.8 kilometers by 12.8 kilometers in size. This receptor grid scenario included emissions from Magnitude 7 and two additional modeling runs based on lower operating loads and exit velocities for the neighboring New Madrid Power Plant. The second receptor grid scenario, depicted in Figure 5, only included receptors located inside the nonattainment, but excluded receptors located inside the property boundary of New Madrid Power Plant. In other words, when compared to the first scenario, receptors were added inside the Magnitude 7 property boundary, but removed from outside the nonattainment area and also removed from the New Madrid Power Plant property boundary. This second scenario did not include emissions from Magnitude 7 or Alubar, and only modeled emissions from New Madrid Power Plant at three operating loads (50, 75 and 100 percent). The purpose of the second scenario is to ensure that emissions from New Madrid Power Plant are not causing violations inside the Magnitude 7 property boundary, since that area is ambient to the power plant. Since New Madrid Power Plant is not a significant contributor to the SO_2 concentrations inside their property boundary, it was unnecessary to model a scenario that only modeled Magnitude 7's impact on the neighboring power plant property.

Figure 4. New Madrid Nonattainment Area Modeling Receptors

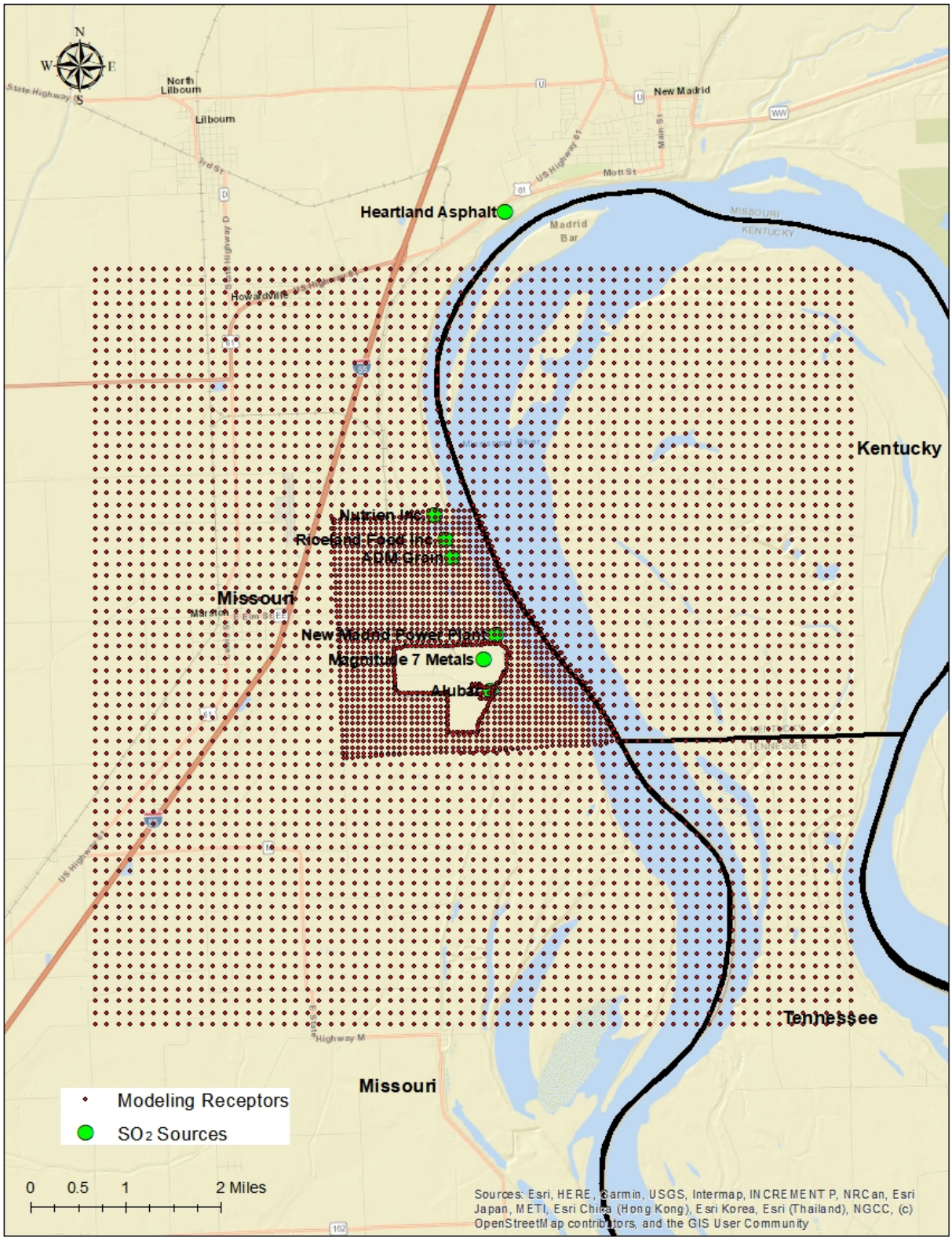
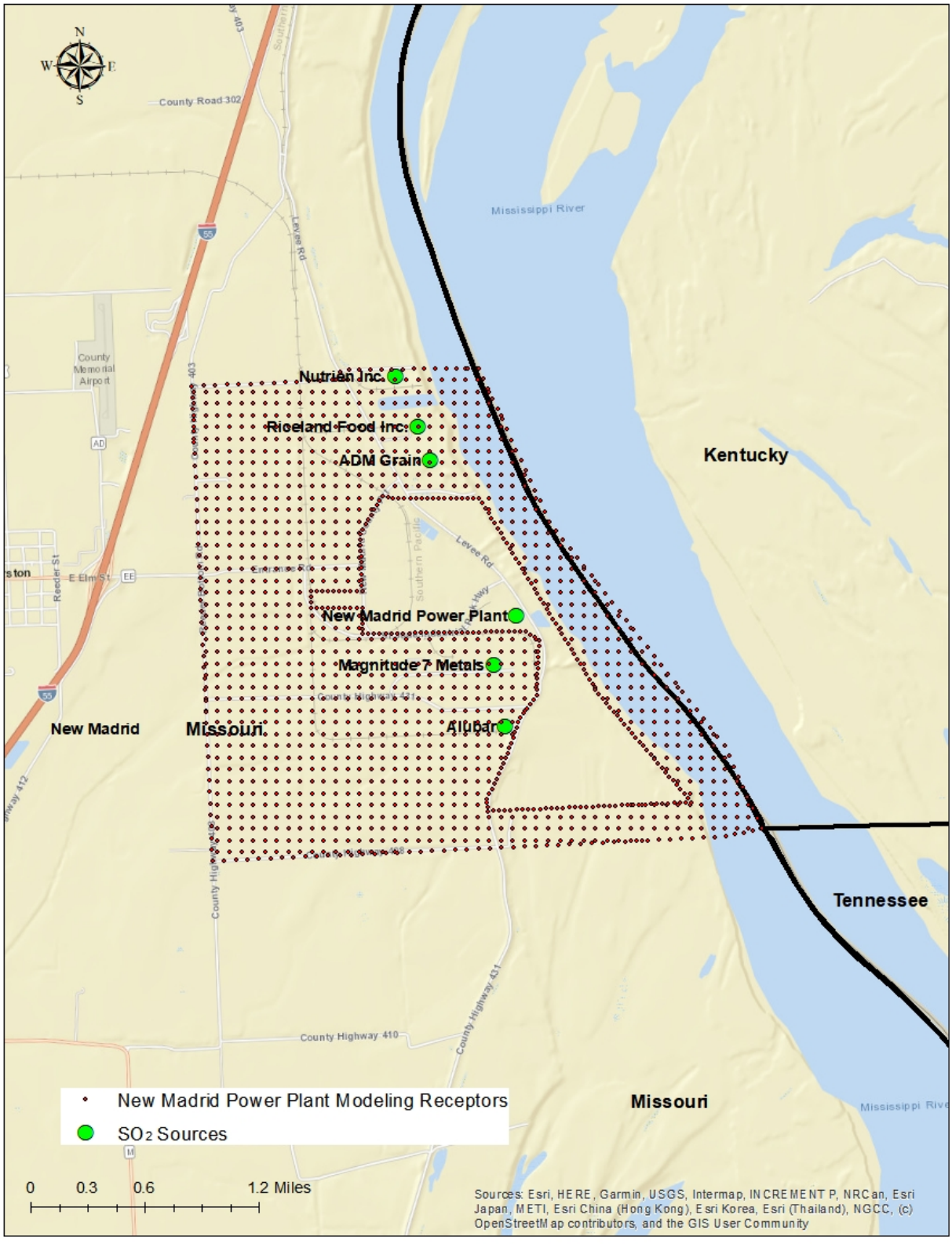


Figure 5. New Madrid Power Plant Modeling Scenario Receptors



4.1.3. Source Emission Rates

The Air Program modeled Magnitude 7 and New Madrid Power Plant based on the allowable emissions at the facilities. The Air Program has entered into enforceable Consent Agreements with both facilities that include emission limits the facilities must comply with. The Consent Agreement for Magnitude 7 also requires the facility to construct a new stack where the emissions from the two operating Carbon Bake Furnaces (Furnaces 1 and 2) will be routed.

In developing the emission limits needed to demonstrate attainment for this plan, the Air Program began the process by working with New Madrid Power Plant. As explained in Chapter 2 of this document, during 2017, the three SO_2 monitors located in the nonattainment area recorded fourth high max daily 1-hour SO_2 concentrations ranging from 5 ppb – 13 ppb. This is well below the 2010 SO_2 standard of 75 ppb. It was not until the summer of 2018, when the Magnitude 7 facility restarted operations that the monitors began measuring exceedances of the standard. This provided a sound basis for concluding that actual emissions from New Madrid Power Plant were not the cause of the 2010 SO_2 standard violations in the nonattainment area. However, the New Madrid Power Plant actual SO_2 emissions from 2016-2020 were well below the facility's permitted allowable SO_2 emission limits that were in place during that time period. For a nonattainment area plan, the modeled attainment demonstration must be based on potential emissions or maximum allowable emissions for contributing facilities located inside the nonattainment area. In light of this, New Madrid Power Plant and the Air Program evaluated current emission level trends at the facility and performed preliminary air dispersion modeling analyses to support the development of an emission rate to be used in the modeled attainment demonstration for this plan. Following deliberation, the parties agreed upon a modeled emission rate of 404 g/s (equal to 3,206.4 lbs/hr) for each unit, or 808 g/s (equal to 6,412.8 lbs/hr) for both units combined.

The Air Program characterizes the emissions from the two units at the New Madrid Power Plant as a common stack or a combined stack in the modeled attainment demonstration. The two stacks were built in one reinforced chimney with two steel liners to serve the two units. The inner diameter of the chimney at the top is 47.5 feet and the inner diameter of each liner is 20 feet. The distance between these two stacks at the top is no more than 7.5 feet. The plumes from the two stacks combine to form one plume. The Air Program discussed the modeled stack characterization of the New Madrid Power Plant with EPA during the development of this plan. EPA concurred the two stacks at New Madrid Power Plant would be better represented in the model as a combined stack.

After determining the modeled emission rate, the next step in the process was to develop the enforceable emission limits that reflect the modeled emission rate used in the attainment demonstration. The initial limits included in the Consent Agreement of the proposed plan for New Madrid Power Plant were individual unit-level limits of 2,785 lbs/hour based on a rolling 30-day average. The Air Program calculated these limits using the process described in Appendix B of EPA's Guidance for SO_2 Nonattainment Area SIPs. The guidance prescribes a process for converting hourly modeled emission rates into enforceable emission limits with averaging periods longer than one hour. The process in the guidance lowers the limit for the longer averaging period to a level that will be of comparable stringency to an hourly limit at the modeled rate based on the degree of actual emission variability from the emission source.

However, in response to numerous comments the Air Program received on the proposed plan, the Air Program began engaging with New Madrid Power Plant to coordinate an amendment to the Consent Agreement. This amended Consent Agreement, which is included in this plan as Appendix F, contains a combined emission limit for Unit 1 and Unit 2 of 5,523 lbs/hr based on a 30-day rolling average. This is slightly less than the sum of the combined individual limits included in the original Consent Agreement from the proposed plan.

The Air Program determined that because the attainment demonstration appropriately characterizes the power plant with a combined stack, it would be more appropriate to design a combined limit for both boilers at the power plant together, instead of unit-level emission limits as included in the proposed plan. The Air Program created a new variability analysis for the New Madrid Power Plant using the combined emissions from both boilers to convert the hourly modeled emission rate into a 30-day limit that provided comparable stringency as an hourly limit in accordance with EPA guidance. The Air Program determined the 30-day rolling average emission limit for the combined stacks based on 2016–2020 CERMS data. The Air Program excluded emission data when the CERMS missing data was based on Method of Determination Code (MODC) 12. This code estimates missing data based on the maximum or minimum value from the default or span record. Removing this estimated data ensures the estimated average is based on accurate and actual measured data.

The Air Program started with the actual hourly CEMS data for New Madrid Power Plan units 1 and 2 from the five-year period from 2016 through 2020. Then for each hour, during the five year period, the Air Program added the hourly emissions from each unit together to get the combined hourly emissions. Then, the Air Program removed all hours where the combined emission rate was zero (hours when neither unit was operating). Then, the Air Program obtained the 99th percentile one-hour combined emission rate from this data set (4,879.54 lbs/hr).

Next, the Air Program created average 30-day hourly emission rates from the hourly facility wide data. The Air Program did this on a daily rolling basis, meaning for each day starting with the 30th day of the data set, the Air Program calculated the average hourly facility wide-emission rate for all hours in the previous 30-day period. The Air Program then obtained the 99th percentile of all these 30-day average emission rates (4,202.73 lbs/hr). Then the Air Program developed a ratio by dividing the 99th percentile 30-day value by the 99th percentile one-hour value (0.8613). Finally, the Air Program multiplied this ratio by the modeled hourly emission rate from the attainment demonstration modeling to obtain the 30-day rolling average combined emission limit for the updated Consent Agreement (5,523 lbs/hr). Appendix C of this plan provides all the calculations used to convert the modeled combined stack emission rate into the 30-day emission limits included in the updated Consent Agreement. Table 5 summarizes the combined 30-day rolling average limit calculation results for New Madrid Power Plant.

Table 5. New Madrid Power Plant 30-day Rolling Average Calculation Results

	Combined Units 1 & 2
Modeled hourly emission rate (lbs SO_2/hr)	6,412.80
99th percentile one-hour actual emissions rate (lbs SO_2/hr)	4,879.54
99th percentile 30-day rolling average actual emissions rate (lbs SO_2/hr)	4,202.73
Ratio (no units)	0.8613
Combined 30-day average daily rolling limit (lbs SO_2/hr)	**5,523**

In the attainment demonstration modeling, the Air Program modeled additional scenarios for New Madrid Power Plant's combined stacks to reflect different operating loads of 50 and 75 percent. This is necessary because although lower operating loads will result in lower emission rates, the emission release parameters, specifically temperature and exit velocity, will also be lower under lower operating loads. The lowering of these emission release parameters could result in less favorable dispersion and higher ground-level SO_2 concentrations, thus the need to examine these alternative load scenarios. For the combined modeled emission rates in these alternative load scenarios, the Air Program assumed that the emission rate for the 50 percent load is 50 percent of the modeled emission rate for the 100 percent load scenario. Similarly, the emission rate for the 75 percent load scenario reflects 75 percent of the modeled emission rate for the 100 percent load scenario. Table 6 describes the combined emission rates used for New Madrid Power Plant in all three load scenarios. The process for determining the emission release parameters for the combined stack under all load scenarios is described in subsection 4.1.4. of this document.

Table 6. New Madrid Power Plant Combined Stack Modeled Emission Rates for Load Scenarios

Modeled Emission Point ID	**Load Scenario (%)**	**Combined Stack Modeled Emission Rate (g/s)**
NMPP12	50	404
	75	606
	100	808

After developing the modeled emission rates to be used in the attainment demonstration for New Madrid Power Plant, the Air Program moved on to develop the modeled emission rates to be used in the attainment demonstration for Magnitude 7. In all scenarios used to develop the modeled emission rates for Magnitude 7, the Air Program included the interactive effects of the modeled emission rates for the New Madrid Power Plant. This way, the attainment demonstration would ensure that all emissions from both facilities, when occurring simultaneously, would still model compliance with the 2010 SO_2 standard.

In addition to the requirement to construct the new Carbon Bake stack, the Consent Agreement for Magnitude 7 also includes maximum hourly SO_2 emission rate limits for three emission points at the facility that take effect in 2025. These emission points include the new Carbon Bake Stack, the existing Pot Line Stack for Pot Lines 1 and 2, and the Pot Line Roof Vents. The modeled hourly emission rates for these emission points in the attainment demonstration are equal to the hourly limits included in the Consent Agreement. Further, the Consent Agreement

prohibits emissions from Pot Line 3 and Carbon Bake Furnace 3 absent a future SIP revision that EPA has approved.

The Air Program originally developed the modeled emission rates for Magnitude 7 based on a series of scenarios assuming a different percentage of the total facility-wide emissions would be released by these three emission points at the facility, and then taking the highest emission rate from all scenarios for each emission point and modeling those values to all be occurring together to simulate a worst case scenario. The original limits from the proposed plan included a facility-wide annual limit, and 30-day rolling average limits for the three individual emission release points. The 30-day limits in the proposed plan were based on the modeled hourly rates from the worst case modeling scenario described in this paragraph. The proposed plan explained that based on engineering judgement of the processes at Magnitude 7, emission variability was unlikely. However, the facility currently lacks continuous emission rate monitoring systems (CERMS), making it impossible to determine with certainty, the degree of emission variability at the facility.

The Consent Agreement does include a requirement for Magnitude 7 to install a CERMS to measure SO_2 emissions from the Pot Line Stack by October of 2023, and to install a CERMS on the new Carbon Bake Stack within 60 days after it is constructed. In response to the comments received on the proposed plan, the Air Program negotiated and executed an amendment for the Magnitude 7 Consent Agreement. The amendment removed the 30-day emission limits, and replaced them with hourly emission limits that will take effect on January 1, 2025. However, the amendment also allows a pre-approved option to convert the hourly limits to 30-day limits after a sufficient amount of CERMS data has been collected. The pre-approved option follows the process in Appendix B of EPA's Guidance for SO_2 Nonattainment Area SIPs.

In the worst case modeling scenario of the attainment demonstration in the proposed plan, the critical emission point was the Magnitude 7 Pot Line Stack. This means that any increase in the modeled emission rate for the Pot Line Stack would result in a modeled violation of the 2010 SO_2 standard. During the negotiation for the amendment to the Consent Agreement, the Air Program acknowledged that modeled emission rates for the new Carbon Bake Stack and for the Pot Line Roof Vents were not set at their respective critical emission rates, but instead were set based on the assumed facility-wide percentages in the worst case modeling scenario. This means those modeled emission rates could increase without resulting in a modeled violation of the standard. Therefore, as part of the amendment negotiation, the Air Program agreed to derive the critical emission rates for these two emission units and use those critical emission rates as the hourly limits in the amended Consent Agreement.

Since the proposed plan had already derived the critical emission rate for the Pot Line Stack, the Air Program next moved to derive the critical emission rate for the Pot Line Roof Vents and included the interactive effects of modeled emission rate for New Madrid Power Plant, the critical emission rate for the Pot Line Stack, and modeled emission rate from the proposed plan for the new Carbon Bake Stack. After determining the critical emission rate for the Pot Line Roof Vents, the Air Program moved on to determine the critical emission rate for the new Carbon Bake Stack. Table 7 provides the modeled emission rates for these three emission points included in the proposed plan's worst case scenario, and also the updated critical emission rates for these same units that are included in the attainment demonstration of this final plan and reflect the hourly emission limits included in the amended Consent Agreement for Magnitude 7.

Table 7. Pot Lines and Carbon Bakes Proposed and Final Modeled Emission Rates

Modeled Emission Point ID	Emission Point	Proposed Plan Modeled SO_2 Emission Rates (tpy)	Final Plan Modeled SO_2 Critical Emission Rates (tpy)
EP61	Pot Line Stack (Lines 1 and 2)	4,447.53	4,447.53
EP59-A	Pot Line 1 Roof Vents – Building A	103.72	121.67
EP59-B	Pot Line 1 Roof Vents – Building B	103.72	121.67
EP60-A	Pot Line 2 Roof Vents – Building A	103.72	121.67
EP60-B	Pot Line 2 Roof Vents – Building B	103.72	121.67
EPAAA	New Carbon Bake Stack	1,345.40	1,390.52
	Total emissions (tpy)	6,207.81	6,324.73

In addition to the emissions from the emission points identified in Table 7, the Air Program modeled all other minor SO_2 sources at Magnitude 7 (and Alubar) at their potential emission rate in the attainment demonstration. Table **8**8 provides the potential emissions from all these other small emission sources at Magnitude 7 (and Alubar) that the Air Program included in the model.

Table 8. Magnitude 7 and Alubar - Other Modeled Emission Points Using Potential Emissions

Description	Emission Point ID	Potential Emission (tpy)
Natural Gas Fired Boiler for Hot Oil System	EP94	0.01813
Natural Gas Fired Boiler for Hot Oil System	EP95	0.01629
Natural Gas Fired Boiler for Hot Oil System	EP96	0.01629
Carbon Rodding Aluminum Spray Furnace	EP97	0.00526
Stack for Old Pig Melter	EPAB	0.05729
Stack for #1MP&S Melter	EPAD	0.05729
Stack for #1 MP&S Holder	EPAE	0.03390
Stack for #2 MP&S Melter	EPAF	0.05729
Stack for #2 MP&S Holder	EPAG	0.03390
Stack for #4 MP&S Melter	EPAH	0.08541
Stack for #4 MP&S Holder	EPAI	0.03390
Stack for Homogenizing Furnace #1	EPAJ	0.03916
Stack for Homogenizing Furnace #2	EPAK	0.03916
Stack for Homogenizing Furnace #3	EPAL	0.03916
Stack for PIG Melter 2	EPAN	0.07280
Natural Gas Fired Boiler for Office Heat	EPBI	0.00150
Natural Gas Fired Boiler for Locker Room Heat	EPBJ	0.00300
Natural Gas Fired Boiler for Locker Room Heat	EPBK	0.00300
Alubar (Rod Mill)-Stack for Rod Mill #1 Melter	EPBA	0.06754
Alubar (Rod Mill)-Stack for Rod Mill #1 Holder	EPBB	0.02602
Alubar (Rod Mill)-Stack for Rod Mill #2 Melter	EPBC	0.06754
Alubar (Rod Mill)-Stack for Rod Mill #2 Holder	EPBD	0.02602
Alubar (Rod Mill)-#5 Rod Mill Holder	EPBH	0.01551
Alubar (Rod Mill)-Holding Furnace	EP113	0.02602
Alubar (Rod Mill)-Holding Furnace	EP114	0.02497

4.1.4. Emission Release Parameters

To accurately predict the dispersion of pollutants within the atmosphere, the air quality model must have information that describes how the emissions are released into the atmosphere. The document titled "User's Guide for the AMS/EPA Regulatory Model AERMOD" outlines the source classification system (point, volume, area, buoyant, etc.) that is used by the AERMOD modeling system to characterize emission releases within the input file.

For this SO_2 modeling demonstration, all of the emission releases in the model are characterized as point sources, except for the Pot Line Roof Vent emissions at Magnitude 7, which are characterized as buoyant line sources. The emission release parameters for all modeled point sources are based on information provided by the facilities or obtained from information contained within MoEIS. Point source emissions are vented through stacks or isolated vents. In order to assign the point source release parameters, the facility must provide information regarding the location and the nature of the release as follows:

1. Stack height,
2. Stack exit temperature,
3. Stack exit velocity, and
4. Stack diameter.

Magnitude 7 provided stack parameters and emission release information for each of its emission points and for the Pot Lines' fugitive emissions. Stack heights for Pot Lines 1 and 2 stack, and the new Carbon Bake stack are based on GEP. Magnitude 7 provided the modeled flow rate of the Pot Line stack to be 1,200,000 actual cubic feet per minute (acfm), which is reflective of a minimum scrubber flow rate of 300,000 acfm for each of the four scrubbers. This equates to an exit velocity of 11.50 meters per second (m/s) from the tip of the stack.

The volumetric flow rate venting from the new Carbon Bake Stack is based on a system with eight total fans. For the scrubber systems used on the two operating Carbon Bake Furnaces, Magnitude 7 will operate as few as two fans per system (four total). The number of fans will be determined by the Carbon Bakes' flue condition and static requirement. Currently they require six fans, but expect sometime in the future to require fewer. To ensure use of the lower flow rate (worst case for dispersion), Magnitude 7 assumed two fans per system. Each fan runs at 33,000 acfm. The total actual flow rate from the Carbon Bakes new stack is 132,000 acfm, which equates to an exit velocity of 13.32 m/s from the tip of the stack. Magnitude 7 provided nominal 200 Fahrenheit (366.46 Kalvin) gas temperature for the Carbon Bake stack in the engineering control plan based on actual measured temperatures from the baghouses for the Carbon Bakes. Table 9 shows the stack parameters for each of the major emission points for Magnitude 7.

Magnitude 7 only operates Pot Lines 1 and 2, currently. Most of the emissions from Pot Line 1 and 2 are released to the atmosphere through the Pot Line Stack (EP61). The rest of the Pot Line emissions are released through the Pot Line buildings' roof vents. The Air Program modeled the roof vents as buoyant line (BUOYLINE) in AERMOD. The main inputs to the BUOYLINE are averages of line source length, line source width, building length, building height, building

width, and building separation. *Table 10* shows the buoyant line parameters for the Pot Lines 1 and 2 Roof Vents. The Air Program used the average inputs in Table 10 to calculate average line source buoyancy parameter in meters to the fourth power per second to the third power (m^4/s^3) using the following equation:

$$F' = \frac{g\,L\,W\,V\,(Ts-Ta)}{Ts}$$

Where**:**

F' = average line source buoyancy parameter (m^4/s^3)
g = acceleration of gravity (9.81 m/s^2)
L = average line source length (m)
W = average line source width (m)
V = exit velocity (m/s)
Ts = exit temperature (K)
Ta = ambient air temperature (K)

Table 11 shows the stack parameters for other emission points at Magnitude 7.

Table 9. Stack Parameters from Pot Lines 1 & 2 and Carbon Bakes New Stacks

Emission Point ID	**Emission Point**	**Stack Height (m)**	**Temperature (K)**	**Exit Velocity (m)**	**Stack Diameter (m)**
EP61	Pot Lines (1 & 2)	72.03	366.48	11.50	7.92
EPAAA	Carbon Bakes New Stack	65	366.48	13.32	2.44

Table 10. Magnitude 7 Buoyant Lines Parameters

Parameter	Pot Line 1	Pot Line 2	Average
Building Length (m)	527.91	527.91	527.91
Building Height (m)	16.00	16.00	16.00
Building Width (m)	19.81	19.81	19.81
Line Source Length (m)	510.40	510.40	510.40
Line Source Width (m)	5.85	5.85	5.85
Building Separation (m)	19.81	19.81	19.81
Exit Velocity (m/s)	0.95	0.95	0.95
Exit Temperature (K)	310.60	310.60	310.60
Ambient air temperature (K)	294.00	294.00	294.00
Buoyancy Parameter (m^4/s^3)			1,538.21

Table 11. Magnitude 7 other Emission Points Stack Parameters

Emission Point ID	Stack Height (m)	Temperature (K)	Exit Velocity (m)	Stack Diameter (m)
EP94	6.40	298.15	5.00	0.61
EP95	5.18	298.15	5.00	0.46
EP96	4.57	298.15	5.00	0.37
EP97	3.05	298.15	5.00	0.43
EPAB	30.48	866.48	0.78	1.13
EPAD	30.48	866.48	1.55	0.91
EPAE	30.48	755.37	0.52	0.98
EPAF	30.48	866.48	1.55	0.91
EPAG	30.48	755.37	0.52	0.98
EPAH	30.48	866.48	0.99	1.22
EPAI	27.43	755.37	0.61	0.98
EPAJ	14.94	533.15	0.31	0.91
EPAK	14.94	533.15	0.31	0.91
EPAL	14.94	533.15	0.16	1.28
EPAN	30.48	866.48	0.78	1.13
EPBA	15.24	866.48	10.97	1.13
EPBB	15.24	755.37	8.23	1.13
EPBC	15.24	866.48	10.97	1.13
EPBD	15.24	755.37	8.23	1.13
EPBH	15.24	866.48	0.03	0.61
EPBI	5.49	298.15	0.21	0.18
EPBJ	5.79	298.15	0.13	0.21
EPBK	5.79	298.15	0.12	0.31
EP113	15.24	449.82	18.87	0.91
EP114	15.24	449.82	18.87	0.91

New Madrid Power Plant provided the stack parameters for Units 1 and 2 at their facility. The stack height for the combined stack in the modeled is based on GEP of 157.84 meters (517.8 ft.). As explained in subsection 4.1.3 of this document, the Air Program modeled additional scenarios for New Madrid Power Plant's combined stack to reflect different operating loads of 50, 75, and 100 percent. For each scenario, the Air Program started with the unit level stack parameters. For the 100 percent load scenario, the unit level exit velocity and temperature are based on the average of the 2017-2019 hourly data corresponding to loads greater than 600 megawatts. For the 50 percent load scenario, the unit level exit velocity and temperature are based on the average of all 2017-2019 hourly data where the actual load fell between 40 and 60 percent. For the 75 percent load scenario, the unit level exit velocity and temperature are based on the average of all 2017-2019 hourly data where the actual load fell between 65 and 85 percent.

After determining the unit level stack parameters. The Air Program calculated the combined stack parameters for use in the modeled attainment demonstration with the following equations:

The equation used to combine the exit velocities is

$$\mathrm{Vc} = \frac{(\mathrm{V1} + \mathrm{V2}) \times R^2}{Rc^2}$$

Where:

Vc = combined velocity
V1 = velocity of unit 1
V2 = velocity of unit 2
R = radius of each flue – Units 1 & 2 are identical
Rc = equivalent radius, which is the square root of area of combined flues divided by 3.1416

The equation used to combine the exit temperatures is

$$\mathrm{Tc} = \frac{[(\mathrm{T1} \times \mathrm{V1}) + (\mathrm{T2} \times \mathrm{V2})]}{(\mathrm{V1} + \mathrm{V2})}$$

Where:

Tc = combined temperature
T1 = temperature of unit 1
T2 = temperature of unit 2

Table 12 provides the unit level stack parameters for Units 1 and 2 as well as the stack parameters for the combined stack, which was used in the model, for all three modeled load scenarios.

Table 12. New Madrid Power Plant Units 1 & 2 and the Modeled Combined Stack Parameters

Modeled Emission Point ID	Emission Point	Load	Stack Height (m)	Temperature (K)	Exit Velocity (m)	Stack Diameter (m)
N/A	Unit 1	50%	157.84	411.87	19.13	6.10
		75%	157.84	411.40	23.23	6.10
		100%	157.84	415.10	27.58	6.10
N/A	Unit 2	50%	157.84	419.96	18.75	6.10
		75%	157.84	419.26	21.48	6.10
		100%	157.84	420.97	24.86	6.10
NMPP12	Combined Stack	50%	157.84	415.87	18.94	8.62
		75%	157.84	415.18	22.36	8.62
		100%	157.84	417.88	26.22	8.62

4.1.5. Terrain Elevations

In addition to assigning receptor locations, the receptor options within the AERMOD system allow the user to input information regarding the terrain surrounding the facility. AERMOD is capable of calculating air pollutant concentrations in terrain that can be classified as simple, flat, complex, or mountainous land. In order to calculate concentrations in complex or mountainous terrain situations, AERMOD must have information about the surrounding terrain and its

features. To aid in the definition of the terrain features, EPA developed a pre-processor, AERMAP (version 18081) to search terrain data for base elevations and features that may influence the dispersion of pollutants within the modeling domain. Outstanding features are assigned an elevation that is referred to as the hill height scale; a value that must be included in the AERMOD input file.

The Air Program used the U.S. Geological Survey (USGS) 7.5-Minute Digital Elevation Model (DEM) (approx. 30-meter resolution) files and processed them through AERMAP. The Air Program converted all sources, receptors and terrain elevation data to Universal Transverse Mercator (UTM) Zone 15 in the North American Datum of 1983 (NAD83) geodetic datum.

4.1.6. Meteorological Data

Because AERMOD does not accept raw meteorological data, it must be processed through AERMET, the meteorological data pre-processor for the AERMOD modeling system. AERMET (version 21112) extracts and processes meteorological data in order to calculate the boundary layer parameters that are ultimately necessary for the calculation of pollutant concentrations within the atmosphere.

To accurately calculate the boundary layer parameters, the user must input three characteristics that describe the surface surrounding the meteorological site: surface roughness, albedo and Bowen ratio. Because these surface characteristics can influence the similarity profiles used in AERMOD, the user must determine if the surface characteristics at the meteorological site are similar to those at the facility site. A direct comparison between the surface characteristics at the meteorological site and those at the surface site is necessary to determine if the differences will significantly impact the overall pollutant concentrations.

In order to provide a consistent method for determining surface characteristics, EPA developed a mathematical tool, AERSURFACE, to determine surface roughness, Bowen ratio, and albedo values for input into AERMET. AERSURFACE (version 20060) employs land cover data from the United States Geological Survey 2016 National Land Cover data archives. Each of the 20 land use categories contained within the land cover database are linked to a set of seasonal surface characteristics defined in Tables 2-2 and 5-2 of the AERSURFACE User's Guide. The seasonal categories represent the same categories employed by the AERMOD system for its gas deposition algorithms.

As noted in the AERSURFACE User's Guide, EPA's recommendations for determining surface characteristics presented in the AERMOD Implementation Guide (EPA, 2019c), have been incorporated into the AERSURFACE tool. The Air Program agrees with the recommendations and executed AERSURFACE using the default values described below:

- Bowen ratio
  - Ten kilometer by ten kilometer domain centered on the site.
- Albedo
  - Ten kilometer by ten kilometer domain centered on the site.
- Surface roughness length
  - Default upwind distance of one kilometer centered on the site,

- Twelve, 30 degree meteorological sectors,
- The two distinct methods for estimating surface roughness length, ZORAD and ZOEFF, and
- Incorporation of impervious and tree canopy data.

Other considerations made in the execution of the AERSURFACE tool include the site type, site climatology, and surface moisture. Because the surface moisture can vary based on the meteorological period, the Air Program executed AERSURFACE for each moisture condition. The Air Program determined the Bowen ratio characteristics applied in Stage 3 AERMET processing based on the precipitation totals from the meteorological record for the time period being processed. For example, if the meteorological period reported above average precipitation totals, the Bowen ratio values for wet surface moisture were chosen.

Magnitude 7 has a meteorological station that collects only wind speed and wind direction data. The Air Program did not use the data in the analysis. The reason this onsite meteorological data was not used in this plan is because, according to 2018, 2019, 2020 and 2021 technical audit reports (see Appendix G) of the three ambient SO_2 monitoring sites and the meteorological station, either the wind speed sensor or the wind direction sensor at the site did not meet the quality assurance criteria for regulatory dispersion modeling. There was no audit conducted for the meteorological station in 2017. Therefore, for this modeling exercise, the Air Program compared surface characteristics surrounding multiple airports across the state to the surface characteristics surrounding Magnitude 7 facility. Based on this analysis, the Cape Girardeau Airport was most similar to the application site. The Air Program also used upper air data from Springfield Airport.

The meteorological data spanned the period from 2017–2021 and included one-minute Automated Surface Observing System (ASOS) wind data. The Air Program obtained the one-minute ASOS data from the National Climatic Data Center in the TD-6405 data format that includes the two-minute average wind speed and direction for each minute within an hour. The use of the one-minute ASOS data more accurately depicts the average hourly wind flow than the single instantaneous reading of wind speed and direction that is typically used in air quality modeling analyses. There are several advantages to supplementing the TD-3280 data with TD-6405 data.

One advantage of supplementing the TD-3280 data with TD-6405 data is the increased frequency of measurements resulting in increased potential for non-calm or non-missing data. The instantaneous reading included in the TD-3280 data file represents the two-minute average wind speed and direction at a specified time, typically ten minutes before the hour. If the measured value is missing or variable, the data for that hour is reported as calm, or missing. Comparatively, when using TD-6405 as a supplement, the wind speed and direction values are based on the hourly average of all of the two-minute averages that are collected within that hour at the ASOS station. If the hour has at least two usable non-calm observations during the first half hour or at least one usable non-calm observation in the last half hour, the direction and speed has a valid value. Using each minute instead of a specific time, the TD-6405 data increases the likelihood that the hour will have a valid value.

Another advantage of supplementing the TD-3280 data with TD-6405 data is the wind speed threshold of the anemometer increases. Where the TD-3280 data reports any wind speed below

three knots as calm; TD-3280 data supplemented with TD-6405 data reports the wind speed threshold is less than or equal to two knots. If the ASOS station is a member of the Ice Free Winds Group, the wind speed threshold is effectively zero.

Lastly, the TD-3280 data file reports wind direction to the nearest ten degrees. In order to obtain a wind direction based on the nearest degree, the EPA developed a procedure to "randomize" the reported wind direction using a single-digit random number for each hour of the year. To obtain a wind direction based on the nearest degree, the sum of the wind direction and the random number are subtracted by four. The process of randomizing the wind direction is not necessary when utilizing the one-minute ASOS data because the wind direction is reported to the nearest degree rather than the nearest ten degrees.

AERMET produced two files for input for each of the five years of meteorological data. The first file contains the boundary layer scaling parameters (surface friction velocity, mixing heights, and Monin-Obukhov length), reference height winds, and temperature. The second file contains a vertical profile of winds, temperature, and the standard deviation of the fluctuating components of the wind.

4.1.7. Building Downwash

The Air Program calculated Building downwash using the Building Profile Input Program (BPIP) with plume rise model enhancements (PRIME), version 04274. The information needed to execute BPIP PRIME includes the heights and locations of structures, which may contribute to building downwash, and the stack locations in relation to these structures. Based on the facility configuration, the Air Program determined if a stack is subjected to wake effects from a surrounding structure(s). If structure wake effects are evident, flags are set to indicate which stacks are affected by building wake zones. Once it is determined that a stack is influenced by a structure, BPIP will calculate the building heights and widths to be included in the dispersion model so that building downwash effects are considered.

The Air Program included building information from both Magnitude 7 and New Madrid Power Plant. The Air Program used aerial photography to quality assure the locational data for BPIP PRIME program input.

4.1.8. Good Engineering Practice Stack Height

Good Engineering Practice (GEP) stack height refers to the height at which emission releases from isolated stacks or vents will not cause excessive ground level concentrations in the immediate vicinity of a source due to building downwash effects or complex terrain. Section 123 of the CAA limits the modeling stack height to GEP when performing air quality analyses in an effort to prevent facilities from installing excessively tall stacks to meet ambient air quality and increment standards.

When performing air quality analyses, the EPA has outlined three different techniques for determining GEP stack height:

1. Stacks less than the 65 meter *de minimis* level; do not have to undergo a GEP determination,
2. GEP is calculated using mathematical formulas that consider nearby building dimensions and building/stack configurations, or
3. GEP is calculated using fluid model studies.

For sources with site specific data availability, the Air Program models all stacks at the lesser of their actual stack height, or GEP stack height as determined by the BPIP PRIME preprocessor. The Air Program includes building downwash influences obtained from the BPIP PRIME output in the model input file for the air quality dispersion model as deemed necessary on a case-by-case basis. For any stack built prior to December 31, 1970, the Air Program models it based on the actual stack height per 40 CFR 52.21(h).

In the proposed plan, the Air Program limited facility-wide SO_2 emissions at Magnitude 7 to less than 5,000 tons per year. The purpose of the limit was to ensure that the SIP could take credit in the model for the dispersion characteristics of new carbon bake stack. The federal definition of dispersion technique per 40 CFR 51.100(hh)(2)(v) allows credit for certain dispersion techniques if the resulting allowable sulfur dioxide emissions from the facility do not exceed 5,000 tons per year.

However, comments from Magnitude 7 on the proposed plan indicated that the new Carbon Bake Stack does not meet the definition of dispersion technique in the federal regulation, and thus credit for the improved dispersion from the new stack is allowable without the inclusion of a 5,000 tons per year facility-wide limit. The Air Program has reviewed this information. It is allowable to take credit for improved dispersion resulting from increasing an existing stack up to GEP stack height. The new carbon bake stack is designed to be constructed at GEP stack height. Magnitude 7 states that it is the raising of the stack height to GEP that is improving the dispersion, not the combining of the stacks, which is necessary as a sound engineering practice, as opposed to raising each individual stack. However, 40 CFR Appendix W to Part 51 7.07.2.1.2a. states that "[t]he use of […] credit resulting from any other dispersion technique is prohibited in the development of emissions limits by 40 CFR 51.118 and 40 CFR 51.164."; consequently, based on the definition of dispersion technique per 40 CFR 51,100(hh)(1)(iii), to increase "final exhaust gas plume rise by […] combining exhaust gases from several existing stacks into one stack" is a prohibited dispersion technique. Because the new stack will combine exhaust streams into a common stack, which may result in an increase of final exhaust plume rise, and because the new common stack is higher than the existing stacks, the project may meet the definition of a dispersion technique, and would therefore be prohibited, unless the resulting allowable emissions of sulfur dioxide from the facility do not exceed 5,000 tons per year, per 40 CFR 51.100(hh)(2)(v).

Currently, Magnitude 7 is not operating Carbon Bake Furnace 3 or Pot Line 3, and per the Consent Agreement included in this plan, the facility cannot restart these operations without a future SIP revision and subsequent approval by EPA. Due to this, Magnitude 7 is able to comply with the 5,000 ton per year limit, and the facility agreed to include it in the proposed plan. The reason the Air Program included this limit in the Consent Agreement for Magnitude 7 in the proposed plan was to ensure, with certainty, that the plan could take credit in the model for the improved stack characteristics pursuant to 40 CFR 51.100(hh)(2)(v). However, Magnitude 7 never agreed that the new stack met the regulatory definition of dispersion technique.

Due to the difficulty in coming to an agreement on this issue that the Air Program, Magnitude 7, and EPA can agree to, the Air Program worked with Magnitude 7 on a solution that would both provide the best chance for EPA approval of this plan, and reserve the opportunity for Magnitude 7 to make the case that the new stack is not a prohibited dispersion technique, if and when needed for a future project (such as a future restart of Pot Line 3). The solution is to ensure the narrative in this plan clearly states that no decision has been made as to whether the combining of the existing carbon bake stacks into the new stack would constitute a prohibited dispersion technique. However, the plan is retaining the 5,000 ton per year facility-wide limit, so there is no question whether credit can be taken in the modeled attainment demonstration for the new stack dispersion characteristics. Further, in an effort to ensure the 5,000 tpy facility-wide limit option from 40 CFR 51.100(hh)(2)(v) is available to allow for more certainty in EPA approval of this plan, the Air Program revised the mass balance spreadsheet in the Consent Agreement with Magnitude 7 to account for the emissions from all the low-emitting emission points at the Magnitude 7 facility as identified in Table 8 of this document, to ensure the 5,000 ton per year limit accounts for all emission points at the facility.

4.1.9. Background Concentrations

According to 40 CFR Part 51 Appendix W, background concentrations must be considered when determining compliance with the 2010 SO_2 standard. To account for natural source impacts, sources that are not explicitly modeled, and unidentified sources, the Air Program used 2019-2021 monitoring data from the Mark Twain State Park monitor to establish background concentrations to incorporate into the modeling results. To account for nearby sources, the Air Program reviewed existing SO_2 ambient monitoring data and inventory data in the vicinity of such monitors. The Air Program identified no major SO_2 emission sources within 20 kilometers of the Air Program monitoring site at Mark Twain State Park. Therefore, the Air Program decided to use the monitoring data from Mark Twain State Park as the background concentration for this modeling exercise. The 2019–2021 design value at Mark Twain State Park is five parts per billion (13.08 $\mu g/m^3$). The Air Program used this value in the modeling exercise to account for all sources not explicitly modeled in the attainment demonstration.

5. Modeling Demonstration

5.1. Modeling Scenarios

The Air Program ran six separate modeling scenarios. This includes three New Madrid Power Plant modeling scenarios to ensure emissions from New Madrid Power Plant would not cause violations within the Magnitude 7 property boundary, which is ambient to New Madrid Power Plant. In these three scenarios, the Air Program did not model emissions from the Magnitude 7 facility. The other three scenarios are the attainment demonstration modeling scenarios utilizing the critical modeled emissions rates from Magnitude 7 and all three load scenarios (50, 75, and 100 percent) for New Madrid Power Plant.

5.1.1. New Madrid Power Plant Modeling Scenarios

In these modeling scenarios, the Air Program used a receptor grid that excludes receptors inside the New Madrid Power Plant property boundary. The purpose for these scenarios was to determine the effects of the New Madrid Power Plant emissions on the Magnitude 7 property, which is considered ambient to the Magnitude 7 property. In these scenarios, the Air Program excluded emissions from Magnitude 7 and only explicitly modeled emissions from New Madrid Power Plant. Table 13 shows the emission rate and stack parameters used in these three various load option scenarios for New Madrid Power Plant. Table 14 shows the modeling results from the 100 percent load scenario, which had the highest modeled SO_2 concentrations. Figure 6 shows the concentration plot from this 100 percent load emission scenario. The figure shows the maximum modeled impact from the New Madrid Power Plant emissions and the modeled background concentration for all modeled receptors in these scenarios was between 13 and 134 micrograms per cubic meter ($\mu g/m^3$), which complies with the 2010 SO_2 standard of 196.7 $\mu g/m^3$ (75 ppb at normal atmospheric conditions).

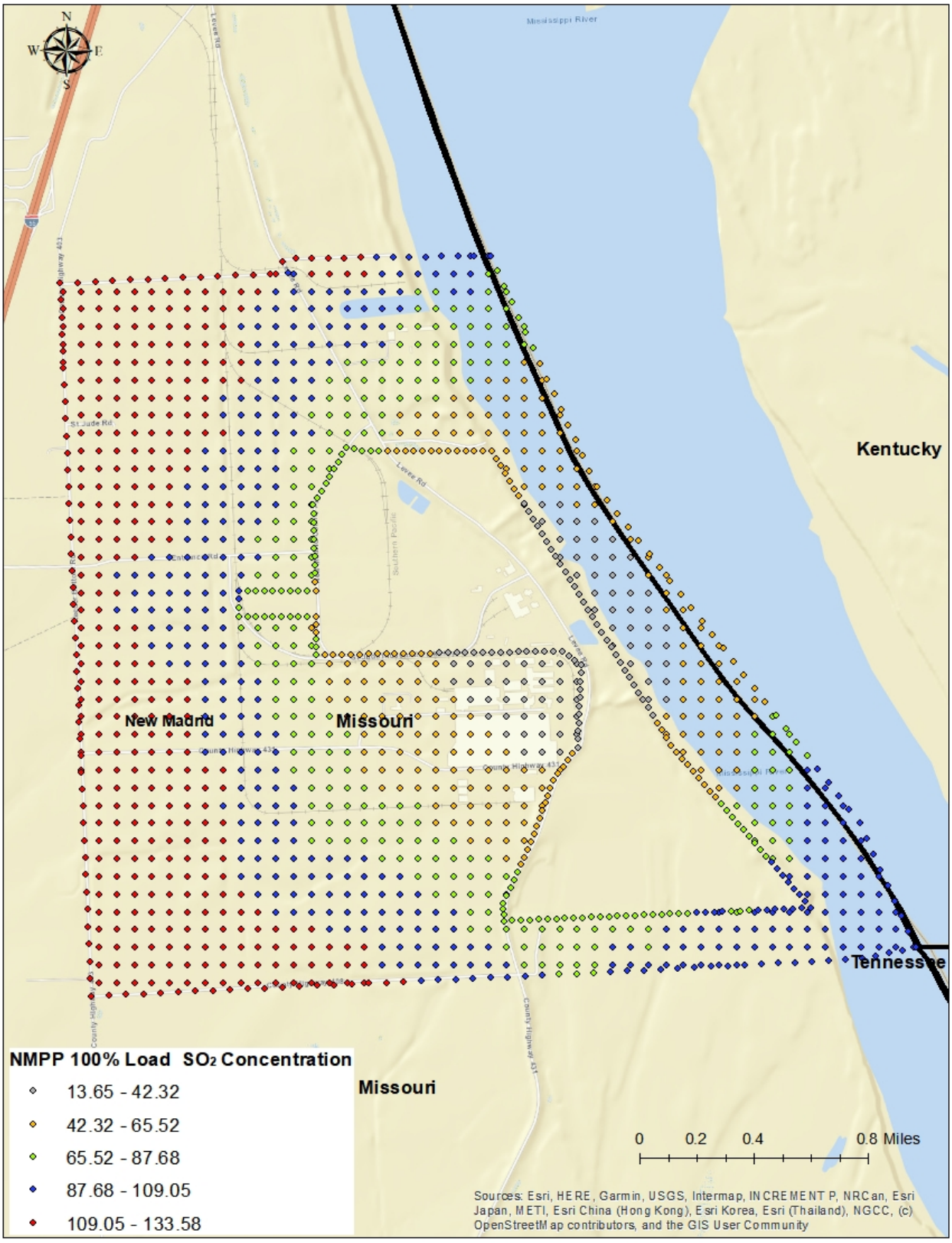
Table 13. New Madrid Power Plant Modeled Emission Rates and Stack Parameters

Modeled ID	Load	Emission Rate (g/s)	Stack Height (m)	Temperature (K)	Exit Velocity (m)	Stack Diameter (m)
NMPP12	50%	404	157.84	415.87	18.94	8.62
	75%	606	157.84	415.18	22.36	8.62
	100%	808	157.84	417.88	26.22	8.62

Table 14. Results from New Madrid Power Plant Modeling Scenarios

Load	Maximum Concentration ($\mu g/m^3$)	Location	
		X (m)	Y (m)
50%	87.76	805477.23	4044547.64
75%	114.58	805432.24	4044477.88
100%	133.58	805377.23	4045447.64

Figure 6. Concentration Plot for New Madrid Power Plant 100% Load Modeling Scenario



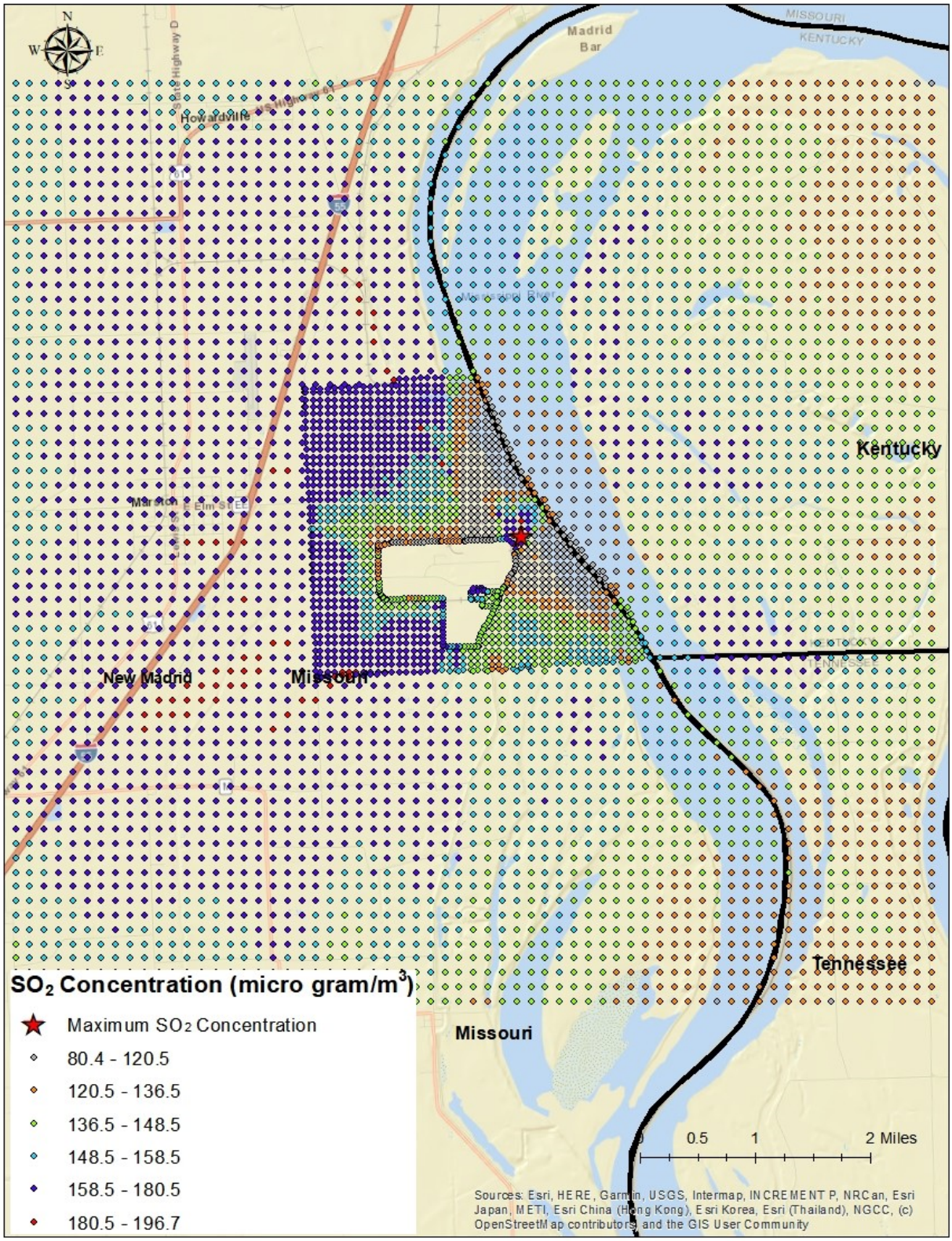
5.1.2. Attainment Demonstration Modeling Scenarios

The Air Program developed the attainment demonstration modeling scenarios using the maximum allowable hourly limits (and PTE from small emission sources at Magnitude 7 and Alubar) from the Magnitude 7 Consent Agreement in combination with the attainment demonstration modeled emission rates for the three load scenarios (50, 75 and 100 percent) at New Madrid Power Plant. All of these three emissions modeling scenarios excluded receptors inside the Magnitude 7 property boundary. Table 15 shows the maximum modeled five-year average of the fourth highest maximum daily SO_2 concentration contributions from each emission point at Magnitude 7 and from the combined modeled stack at New Madrid Power Plant. The table also provides the total five-year average maximum modeled design value of all receptors from these three modeling scenarios with the different load scenarios at New Madrid Power Plant. The three attainment demonstration modeling scenarios all modeled a total of 6,325.34 tons per year of SO_2 emissions from Magnitude 7 and the 100 percent load scenario modeled 28,088.20 tons per year of SO_2 emissions from New Madrid Power Plant. The highest five-year average 99^{th} SO_2 concentration of all modeled receptors in these three modeling scenarios is 196.7 $\mu g/m^3$, which demonstrates compliances with the 2010 SO_2 standard. Figure 7 shows the concentration plot for the attainment demonstration modeling scenario with New Madrid Power Plant at 100 percent load, which resulted in the highest modeled SO_2 concentrations of the three load scenarios from the attainment demonstration modeling scenarios. All AERMOD input and output files for the six modeling scenarios discussed in this Chapter of this document are provided in Appendix D of this plan.

Table 15. Attainment Modeling Results

Model Group ID	**Description**	**2017-2021 Concentration ($\mu g/m^3$)**		
EP61	Pot Lines (1 & 2)	180.2		
EPAAA	New Carbon Bake Stack	71.6		
BLINE	Pot Lines (1 & 2) Roof Vents	169.4		
M7M-NG	Minor Emission Sources – PTE emissions from Magnitude 7 and Alubar	2.7		
M7M	Magnitude 7 Combined	183.7		
BACKGRND	Background Concentration	13.1		
AECI	New Madrid Power Plant (combined Units 1 & 2)	50% Load	75% Load	100% Load
		74.8	103.1	126.9
ALL		196.7	196.7	196.7

Figure 7. Concentration Plot the Attainment Modeling Scenario with New Madrid Power Plant at 100% Load



6. Control Strategy

The Clean Air Act requires nonattainment area SIPs to provide for attainment of the standard based on emission reductions from control measures that are permanent and enforceable. The Clean Air Act and EPA's Guidance on SO_2 Nonattainment Area SIPs directs air agencies to consider all RACM/RACT for emission reductions that contribute to attainment of the standard as expeditiously as practicable. Section 172(c)(1) of the CAA stipulates that nonattainment plans shall provide for the implementation of all reasonably available control measures as expeditiously as practicable (including such reductions in emissions from existing sources in the area as may be obtained through the adoption, at a minimum, of reasonably available control technology) and that such measures shall provide for attainment of the applicable NAAQS.

Pursuant to section 172(c) of the Clean Air Act, control measures must be permanent and federally enforceable to be used in a SIP to demonstrate attainment. Federal enforceability is demonstrated via a federally approved SIP which may include a SIP-approved rule, construction permit and/or legally binding agreement such as a consent decree or agreement, or an administrative order on consent (AOC).

The Air Program has entered into Consent Agreements with both of the major SO_2 emission sources located in the nonattainment area. The Air Program and Magnitude 7 signed a Consent Agreement (No. APCP-2022-047A**)** that contains new enforceable hourly emission rates for the three highest emission points at the facility. The Consent Agreement also includes a requirement for Magnitude 7 to construct a new 65-meter stack and to reroute all existing Carbon Bake stack emissions to this new stack. The air dispersion modeling demonstrated that the new stack is necessary to reduce SO_2 concentrations in the New Madrid County SO_2 nonattainment area to levels that will comply with the 2010 SO_2 standard.

In addition, the Consent Agreement for Magnitude 7 includes maximum one-hour average emission rate limits for the new Carbon Bake Stack, the existing Pot Line stack for Pot Lines 1 and 2, and the Pot Line Roof Vents that demonstrate modeled compliance with the 2010 SO_2 standard. The Consent Agreement includes compliance deadline dates for all newly established hourly emission rate limits at Magnitude 7 to become effective and enforceable on January 1, 2025 based on CERMS that the Consent Agreement also requires the facility to install by this date.

It is also noted that the Magnitude 7 Consent Agreement includes a pre-approved option and method to convert the newly established hourly emission rate limits into a 30-day rolling average emission rate limits upon request from Magnitude 7 when sufficient CERMS data is available for the applicable emission point(s). The Consent Agreement includes the precise process to be followed to allow for this conversion, which follows Appendix B of EPA's SO2 Nonattainment Area SIP Guidance. The Consent Agreement also contains several contingency measures that will be implemented without further state legislature or state executive branch rulemaking action if the area fails to meet reasonable further progress goals or if it fails to attain the 2010 SO_2 standard by its attainment deadline. The Consent Agreement also includes all of the necessary monitoring, recordkeeping, and reporting requirements to ensure the limits are practically enforceable. The Magnitude 7 Consent Agreement is provided in Appendix E.

The control strategy also includes newly established 30-day rolling average SO_2 emission rate limits for New Madrid Power Plant. The Air Program and New Madrid Power Plant executed Consent Agreement (No. APCP-2022-048A**)** to establish a new 30-day rolling average SO_2 emission rate limit of 5,523 lbs/hr for the combined emissions from boilers Unit 1 and Unit 2 at the facility. This Consent Agreement also includes all the necessary monitoring, recordkeeping and reporting requirements to ensure it is practically enforceable. The New Madrid Power Plant Consent Agreement is provided in Appendix F.

7. Reasonably Available Control Measures and Reasonable Further Progress

7.1. Reasonably Available Control Measures

Section 172(c)(1) requires SIP provisions to provide for implementation of Reasonably Available Control Measures (RACM) as expeditiously as possible (including such emissions reductions from existing sources obtained through implementation of RACT requirements and to provide for attainment of the NAAQS). The modeling analysis contained within this plan provides for attainment of the 2010 SO_2 standard and constitutes the required RACM analysis.

The Air Program performed a RACM analysis in compliance with RACM Guidance. The Air Program analyzed RACM/RACT for all sources in the boundaries of the nonattainment area that emit at least 99% of the nonattainment area's SO_2 emissions. The Air Program has determined that no additional RACM/RACT requirements are needed beyond those established in this plan.

The SO_2 nonattainment area in New Madrid County is in a unique situation with respect to RACT/RACM requirements. There are two major SO_2 emitting facilities located in the area, Magnitude 7 and the New Madrid Power Plant, that together emit approximately 17,000 – 19,000 tons of SO_2 annually. However, the monitoring data, emission analysis, and air dispersion modeling analyses for the area all conclude that the existing carbon bake, or anode production, process at Magnitude 7 is, by far, the most significant cause of the SO_2 concentrations that are causing the violation of the 2010 SO_2 standard. This carbon bake process emits approximately 600-700 tons of SO_2 annually based on actual reported emissions, which only accounts for approximately 3.5 percent of the total actual combined emissions from these two facilities.

The Air Program recognized that new emission controls installed to control emissions from the carbon bake process at Magnitude 7 would not likely be sufficient to bring the area into compliance with the 2010 SO_2 standard due to the incredibly poor dispersion created by the existing emission release points for this process. Therefore, the Air Program concluded that any control strategy must require improved dispersion from the existing carbon bake stack configuration. Based on past permitting exercises, Magnitude 7 had previously proposed to build a new stack where all carbon bake emissions would be routed. Therefore, as part of the attainment demonstration analysis, the Air Program started with an assumption in the control strategy that included the dispersion characteristics of the new Carbon Bake Stack that Magnitude 7 had previously proposed to be constructed.

At the onset of the analysis, the modeling showed that the improved dispersion characteristics of the new carbon bake stack, which will be constructed according to Good Engineering Practice (GEP) stack height were sufficient to model attainment at all receptors throughout the nonattainment area without further emission reduction measures. As such, no other control requirements were needed or could be deployed to further expedite attainment of the standard. Clean Air Act Section 172(c)(1) intertwines the relationship between the application of RACT and RACM with the expeditious attainment of the applicable standard. Since the new stack demonstrates the area will come into compliance with the standard as expeditiously as practicable without the addition of new emission control technology, the compliance strategy also inherently satisfies the RACT and RACM requirements.

In addition, the modeled attainment demonstration in this plan includes a new SO_2 emission rate limit for the combined emissions from the two boilers at New Madrid Power Plant. This new combined 30-day rolling average SO_2 emission rate limit of 5,523 lbs/hr for the two units at the facility represents the necessary stringency and the appropriate model characterization of the modeled rate for the combined stack at this facility. The new limit, when combined with maximum newly allowable emission rate limits at Magnitude 7 demonstrates modeled attainment of the 2010 SO_2 standard, and inherently satisfies the RACM/RACT requirement for New Madrid Power Plant.

Also noted, the new enforceable limits for both Magnitude 7 and New Madrid Power Plant will prevent emissions at levels above which are modeled to result in a violation of the standard. The limits in the proposed SIP reduce the allowable emissions at both facilities located in the nonattainment area by thousands of tons of SO_2 per year. Since these allowable emission levels demonstrate attainment in the model, they inherently demonstrate that the RACT and RACM requirements are satisfied, since no other measures are needed or could be deployed that would further expedite attainment of the standard.

7.2. Reasonable Further Progress

Section 172(c)(2) of the CAA requires areas designated as nonattainment for criteria pollutants to include a demonstration of Reasonable Further Progress (RFP) in nonattainment area plans. Further, Section 171(1) of the CAA defines RFP as “such annual incremental reductions in emissions of the relevant air pollutant as are required by this part or may reasonably be required by the EPA for the purpose of ensuring attainment of the applicable NAAQS by the applicable attainment date”.

EPA has explained that this definition is most appropriate for pollutants that are emitted by numerous and diverse sources, where the relationship between any individual source and the overall air quality is not explicitly quantified, and where the emission reductions necessary to attain the NAAQS are inventory-wide. EPA has stated the definition of RFP is generally less pertinent to pollutants like SO_2 that usually have a limited number of sources affecting areas of air quality that are relatively well defined, and emissions control measures for such sources result in swift and dramatic improvement in air quality. That is, for SO_2, there is usually a single "step" between pre-control nonattainment and post-control attainment. Therefore, for SO_2, with its discernible relationship between emissions and air quality, and significant and immediate air quality improvements, EPA explained in the General Preamble that RFP is best construed as "adherence to an ambitious compliance schedule" (74 FR 13547, April 16, 1992) and is appropriate for the implementation of the 2010 SO_2 standard.

As stated in EPA’s Guidance for SO_2 Nonattainment SIPs, RFP is satisfied by the strict adherence to an ambitious compliance schedule which is expected to periodically yield significant emissions reductions. The compliance requirements and contingency measures included in Magnitude 7’s Consent Agreement ensure that the requirements of RFP have been satisfied in this plan.

8. Other Nonattainment Area Plan Elements

8.1. Contingency Measures

Section 172(c)(9) of the CAA defines contingency measures as such measures in a SIP that are implemented in the event that an area fails to make RFP, or fails to attain the NAAQS by the applicable attainment date. Contingency measures become effective without further action by the state or EPA. These control measures consist of other available control measures that are not included in the control strategy for the nonattainment area SIP for the affected area.

The Air Program and Magnitude 7 signed a Consent Agreement that contains a control plan to attain the 2010 SO_2 standard. The control plan includes building a new 65-meter stack and rerouting all existing Carbon Bake emissions to the new stack. The air dispersion modeling demonstrates the new stack is necessary to reduce concentrations in the New Madrid County SO_2 nonattainment area to levels in compliance with the 2010 SO_2 standard. In addition, the Consent Agreement includes a new facility-wide annual emissions limit and new maximum one-hour average emission rate limits that reflect the modeled emission levels in the attainment demonstration.

However, the Consent Agreement also contains several contingency measures that will be enacted if the area does not attain the 2010 SO_2 standard following construction of the new stack. The Consent Agreement in Appendix E of this plan stipulates that Magnitude 7 shall be subject to contingency measures in the event the fourth highest one-hour daily maximum SO_2 concentration recorded at any of the individual three ambient SO_2 monitors surrounding the facility exceeds 75 ppb in a single calendar year, beginning 60 calendar days after commencement of operation of the new Carbon Bake Stack. The Air Program will notify Magnitude 7 when a triggering event occurs, based on quality assured monitoring data entered into EPA's AQS. Following a triggering event, the Consent Agreement establishes deadlines for Magnitude 7 to implement contingency measures. The following bullet points and subsequent paragraph and bullet points outline the contingency measures included in the contingency plan that are included in the Magnitude 7 Consent Agreement and will become enforceable without further action by the Air Program should a contingency measure triggering event occur:

- Contingency measure one. On a weekly basis, Magnitude 7 shall implement enhanced lead detection and repair requirements that will include weekly inspection the fluoride scrubbers for the Carbon Bakes and Pot Lines 1 and 2, and the ductwork leading to them based on an approved work practice manual that must stipulate utilization of a portable SO_2 monitor and include route and inspection locations spaced no greater than 30 feet apart both at the ground-level and on each floor of the fluoride scrubbers.
- Beginning nine months after implementation of contingency measure one, Magnitude 7 will be subject to additional contingency measure options in the event the Air Program determines a subsequent triggering event to have occurred. These contingency measure options include:
    - Acquire anodes off-site and cease operation of the Carbon Bake furnaces.
    - Accept a new more stringent sulfur content limit for coke the facility receives.
    - Installation of Flue Gas Desulfurization (FGD) to control SO_2 emissions from the stack for Pot Lines 1 and 2.

- Installation of FGD to control SO_2 emissions from the new Carbon Bake stack.
- Alternative contingency measures the facility proposes and the Air Program approves.

8.2. New Source Review Nonattainment Permitting

Part D of Title I of the CAA prescribes the procedures and conditions under which a new major stationary source or major modification may obtain a preconstruction permit in an area designated nonattainment for any criteria pollutant. The nonattainment new source review (NSR) permitting requirements in section 172(c)(5) and 173 of the CAA are necessary elements of a nonattainment plan. Missouri already has a nonattainment NSR permitting program (10 CSR 10-6.060(7)). The program applies to any nonattainment area as designated under section 107 of the CAA (10 CSR 10-6.020(2)(N)(10)). Therefore, this existing program regulates the construction and modification of major stationary sources of SO_2 located in the New Madrid County SO_2 nonattainment area or any other nonattainment area in the state.

Missouri's nonattainment NSR program ensures that the construction and modification of major stationary sources of SO_2 will not interfere with reasonable further progress toward the attainment of the 2010 SO_2 standard. This is accomplished through applicable regulatory requirements that include, but are not limited to:

- Compliance with Lowest Achievable Emissions Rate (LAER) control technology [10 CSR 10-6.060(7)(C)(8)];
- Acquisition of emissions reductions to offset new emissions of nonattainment pollutant(s) [10 CSR 10-6.060(7)(C)(3)];
- Documentation that all major sources owned and operated in the state by the same owner are in compliance with all applicable CAA requirements [10 CSR 10-6.060(7)(C)(6)];
- Demonstrating via an analysis of alternative sites, sizes, production processes, and environmental control techniques that the benefits of a proposed source significantly outweigh the environmental and social costs imposed as a result of its location, construction, or modification [10 CSR 10-6.060(7)(C)(9) and 10 CSR 10-6.020(2)(A)(42)]; and
- Public notice, acceptance of written comments, and an opportunity for a public hearing on the proposed permit [10 CSR 10-6.060(7)(G)].

The nonattainment NSR requirements apply on a pollutant-specific basis with respect to each nonattainment pollutant for which a source has the potential to emit in amounts greater than the applicable major source threshold for the pollutant [40 CFR §51.165(a)(l)(iv)]. For new sources, in areas that are designated nonattainment for the 2010 SO_2 standard, 100 (tpy) or more of potential SO_2 emissions represents a major amount. Similarly, SO_2 nonattainment NSR requirements also apply to any existing major stationary source of SO_2 that proposes a major modification, i.e., a physical change or change in the method of operation that results in a significant net emissions increase exceeding the de minimis threshold of 40 tpy of SO_2 [40 CFR §51.165(a)(l)(x)(A)].

8.3. Conformity

General conformity is required by CAA section 176(c). This section of the CAA requires that actions by federal agencies do not cause new air quality violations, worsen existing violations, or delay timely attainment of the relevant NAAQS or interim reductions and milestones. General conformity applies to any federal action, other than certain highway and transportation projects, if the action takes place in a nonattainment or maintenance area for any of the six criteria pollutants. Federal Highway Administration (FHWA)/Federal Transit Administration (FTA) projects as defined in 40 CFR 93.101, are generally not subject to general conformity requirements and are instead subject to transportation conformity. However, per 40 CFR 93.101, general conformity requirements do apply to a federal highway and transit project that does not involve title 23 or title 49 funding but still requires FHWA or FTA approval, such as is required for a connection to an Interstate highway or for a deviation from applicable design standards.

The EPA's General Conformity Rule (40 CFR 93.150 to 93.165) establishes the criteria and procedures for determining if a federal action conforms to the SIP. With respect to the 2010 SO_2 standard, federal agencies are expected to continue to estimate emissions for conformity analyses in the same manner as they estimated emissions for conformity analyses under the previous NAAQS for SO_2. The EPA's General Conformity Rule includes the basic requirement that a federal agency's general conformity analysis be based on the latest and most accurate emission estimation techniques available in 40 CFR 93.159(b). When updated and improved emissions estimation techniques become available, the EPA expects the federal agency to use these techniques.

Transportation conformity is required under CAA section 176(c) to ensure that federally supported highway and transit project activities are consistent with (conform to) the purpose of the SIP. Transportation conformity applies to areas that are designated nonattainment, and those areas redesignated to attainment after 1990 (maintenance areas with plans developed under CAA section 175A) for transportation-related criteria pollutants.

Due to the relatively small, and decreasing, amounts of sulfur in gasoline and onroad diesel fuel, the EPA' s transportation conformity rules do not apply to SO_2 unless either the EPA Regional Administrator or the director of the state air agency has found that transportation-related emissions of SO_2 are a significant contributor to the nonattainment problem, or if the SIP has established an approved or adequate budget for such emissions as part of the RFP, attainment, or maintenance strategy (40 CFR 93.102(b)(l), (2)(v)). Missouri has not established an approved or adequate budget for SO_2. Therefore, transportation conformity rules for SO_2 do not apply to Missouri.

9. Public Participation

In accordance with Section 110(a)(2) of the CAA, the Missouri Air Conservation Commission (MACC) held a public hearing prior to adoption of this SIP revision and the subsequent submittal to EPA. The Air Program notified the public and other interested parties of the public hearing and comment period at least thirty days prior to the public hearing for this SIP revision. Specifically –

- Notice of availability of the proposed SIP revision and announcement of the public hearing was posted on the Air Program website by October 31, 2022.

- The MACC held a public hearing to receive comments for the proposed SIP revision on December 1, 2022.

- The Air Program opened a public comment period after posting the proposed SIP revision on the Air Program's website on October 31, 2022. The public comment period closed on December 19, 2022.

- Appendix H of this document contains all the public comments received and the Department summary of all comments and responses for this plan.

10. CONCLUSION

The Air Program hereby asserts that Missouri has met its CAA sections 172 and 191 obligations to submit a nonattainment area SIP for the New Madrid County SO_2 Nonattainment Area. This document demonstrates attainment of the 2010 SO_2 standard through air dispersion modeling of allowable emission rates, and addresses all other CAA nonattainment area SIP requirements for the New Madrid County SO_2 nonattainment area. The Air Program prepared this SIP revision in accordance with the CAA, Missouri Air Conservation Law, corresponding state and federal regulations, and EPA guidance.